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Natural Ice Houses.

The Dubuque (Iowa) *Express* says there is a cavern near Decorrah, in that State, so situated that the water which falls from its roof in winter is frozen, and such an amount of ice formed as to serve the citizens of that place, in summer, with the luxury of an abundant supply of ice.

Improved Gang Plow.

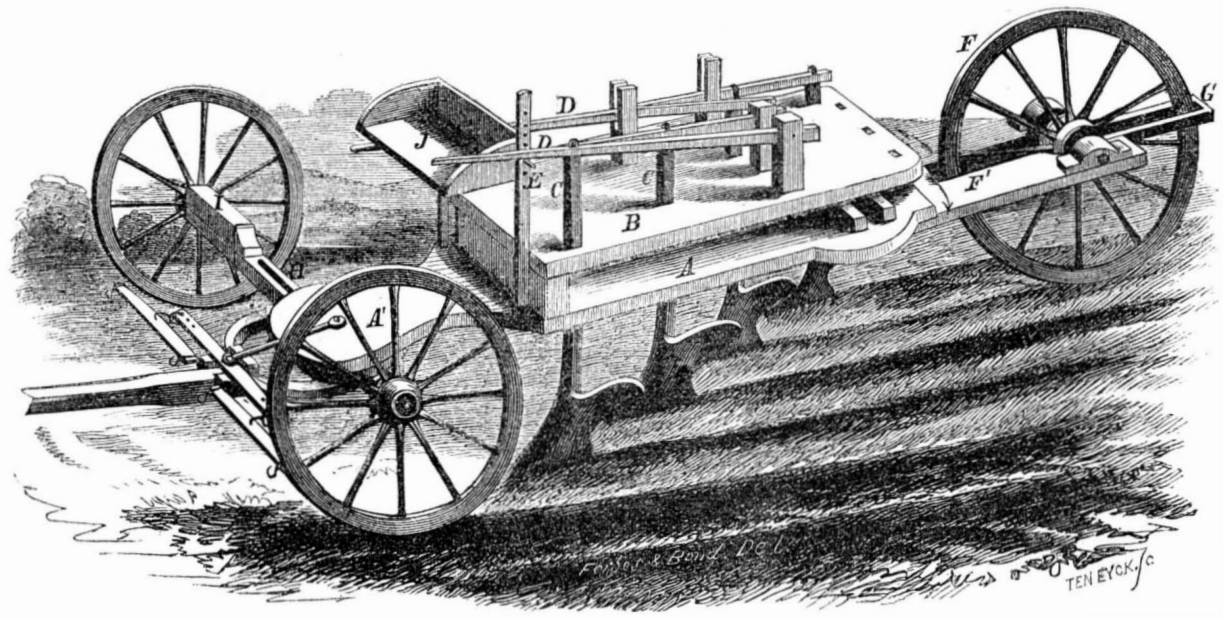
Our engraving illustrates an improvement for which Letters Patent were granted to Messrs. A. and T. S. Smith, of Troy, Ill., on the 4th of March, 1856. The machine is intended to expedite the laborious work of plowing, the arrangement being such as to permit the advantageous use of several plows at once.

A is a strong, flat, bottom board, and B another nearly similar, placed a short distance above A, the two being firmly bolted together at their ends. The shanks of the plows, C, pass through both boards, and connect above with the levers, D, by means of which the plows are raised or depressed at will. The levers are held in any desired position by means of the pins and posts, E. The two boards, A B, being separated, afford a strong and steady support for the shanks of the plows, while, the construction being simple, the plows may be renewed or changed with great facility. Wheel F supports the back end of the machine, and its frame, F, is pivoted to A. It permits the machine to make a very short turn, and adjusts itself. G is a scraper which removes any dirt that adheres to F.

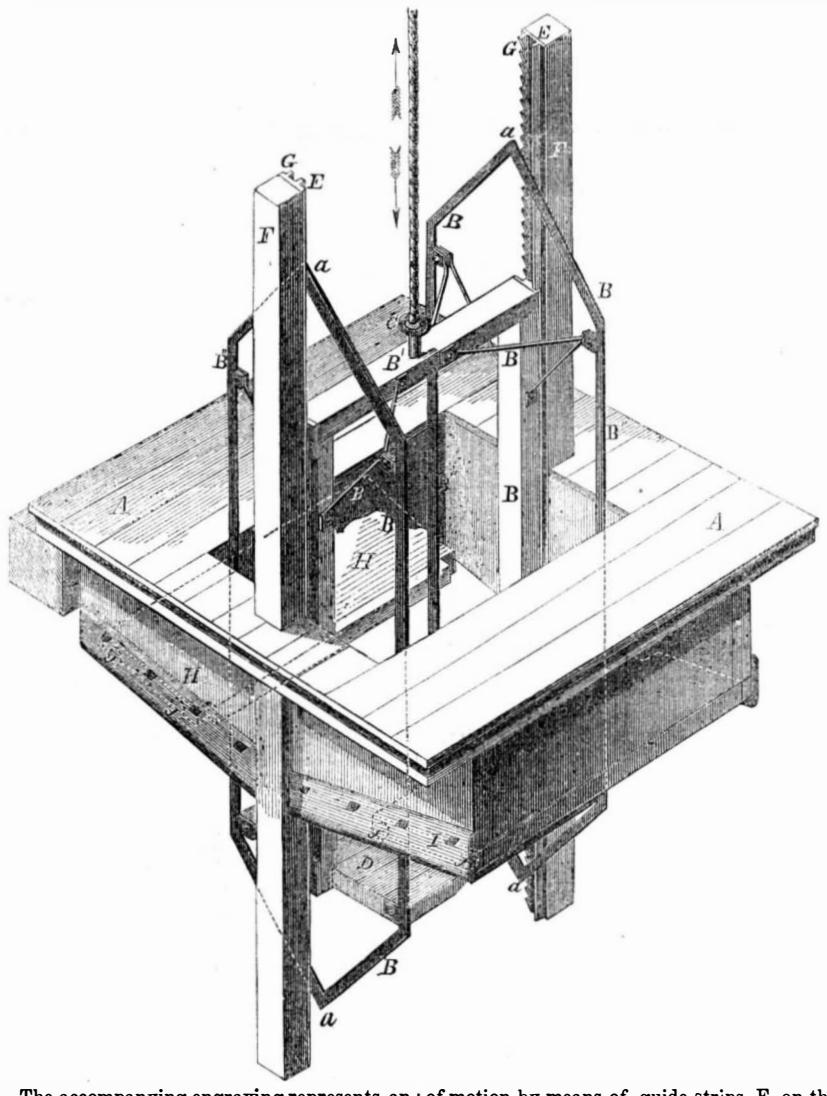
The front axle, H, is slotted longitudinally, so that the front end of the machine, A′, draft tongue bands, etc., may be shifted from side to side, according to the number of plows employed on the occasion. Such shifting is necessary in order to bring the draft always in proper line. The front end, A′, and attachments, are secured at any position on the axle, H, by means of the screw, which permits a ready re-adjustment whenever necessary. The axle is somewhat enlarged at I, and the wheel on that side placed on a different level from its mate wheel, so that when one of the wheels runs in the furrow, the axles of both will be on the same plane.

We are informed that this machine has been put to the severest tests, on all kinds of soils, and is found to operate admirably. When used for breaking up prairie or meadow ground, coulters are attached in front of the plows. In subsoiling, the subsoil plows stand immediately behind the others. The driver has a comfortable seat, J, and the levers, by which he can raise the plows at any instant, are within convenient reach of his hands. Two or four horses may be used, according to the amount of labor required to be done. The inventors inform us that one man, with a pair of horses, using one plow, can break up three acres of corn or oat land per diem, turning the soil ten inches deep. With the same team and three plows, four acres per day. With four horses from four to seven acres. Right or left plows may be used, or both together, for ridging, as desired. One of the most severe labors of the farmer is plowing; but by the use of this machine it becomes a pleasure, for he takes his ease and rides, there being no plow handles to hold. The apparatus is strong, simple, and durable. Works equally well on rough or smooth ground. Does not break by contact with stumps and other obstructions. Is manufactured at a comparatively light cost. Sells for $40 retail. Address the inventors as above for further information.

IMPROVED GANG PLOW.



IMPROVED SAFETY HATCH.



The accompanying engraving represents an improved Safety Hatch, adapted to elevators, for the use of mills and warehouses, for which Letters Patent were granted to William H. Thompson and Eustis P. Morgan, of Biddeford, Me., June 24th, 1856.

A is a section of floor containing the hatch opening. B B′ is the frame of the transportation car, which is raised or lowered by the rope. The latter passes through an eye bolt in the cross piece, B′. The rope is drawn by means of suitable mechanism. D is the platform of the car. The car is guided in its path of motion by means of guide strips, E, on the posts, F. G are ratchet toothed racks, so connected by pawls with the rope, that in case the rope should break, the pawls are instantly brought in contact with the racks, and the car thus prevented from falling. H I (shown chiefly by the dotted lines) are two sliding doors placed beneath the floor, which are closed at all times when the car is not passing through the floor. Upon each end of the doors are truck wheels, J, which run upon tracks; the tracks are so inclined towards the center of the opening in the floor as to cause the doors to move together, and close by their own gravity.

The upper and lower ends of frame, B, are fashioned into wedge shape. This is for the purpose of opening the doors, the apex of the wedges, *a*, entering between the doors, and spreading them apart. In the engraving the car is represented as having passed partly through the floor. The doors having been opened by the action of the wedges, *a*, are retained in that position by the upright sides of the frame, B″. When the car is in motion, either upward or downward, then the side pieces, B″, against which the doors rest, terminating as they do in wedges, will allow the doors to close gradually. If the motion of the car be reversed, the wedges will again enter between the doors and force them gradually open. Thus we see that the doors close the opening in the floor, that they are always closed except at the time when the car is passing through the opening, and that the doors are opened by the action of the car, whether it be passing upward or downward.

It will be observed in the construction here shown, that the doors are placed several inches below the floor, the space being boxed down from the underside of the floor to the top of the doors. The object of this is to allow of the doors closing when the platform of the car is on line with the top of the floor, this being the proper position for receiving and discharging the load.

The safety hatch which is here illustrated is strictly self-operating, and of such construction as to prevent the possibility of accident to person or property by falling through the floor. We regard it as a duty incumbent upon the owners of buildings in which hatches are necessary, to adopt some such humane contrivance as this. Its general introduction would be the means of saving many lives. In case of fire, this invention is invaluable, since it entirely cuts off the communication between the different stories of the building, and thus prevents, in a measure, the draught of air and the spread of the flames. This improvement possesses many other advantages over the common open hatchway, which will be obvious to the reader.

The expense of its introduction is from $35 to $40 per floor. Its parts are simple, and there is nothing about it likely to get out of order. It is in use in a number of factories, and gives, we understand, the greatest satisfaction. Address the inventor as above for further information.

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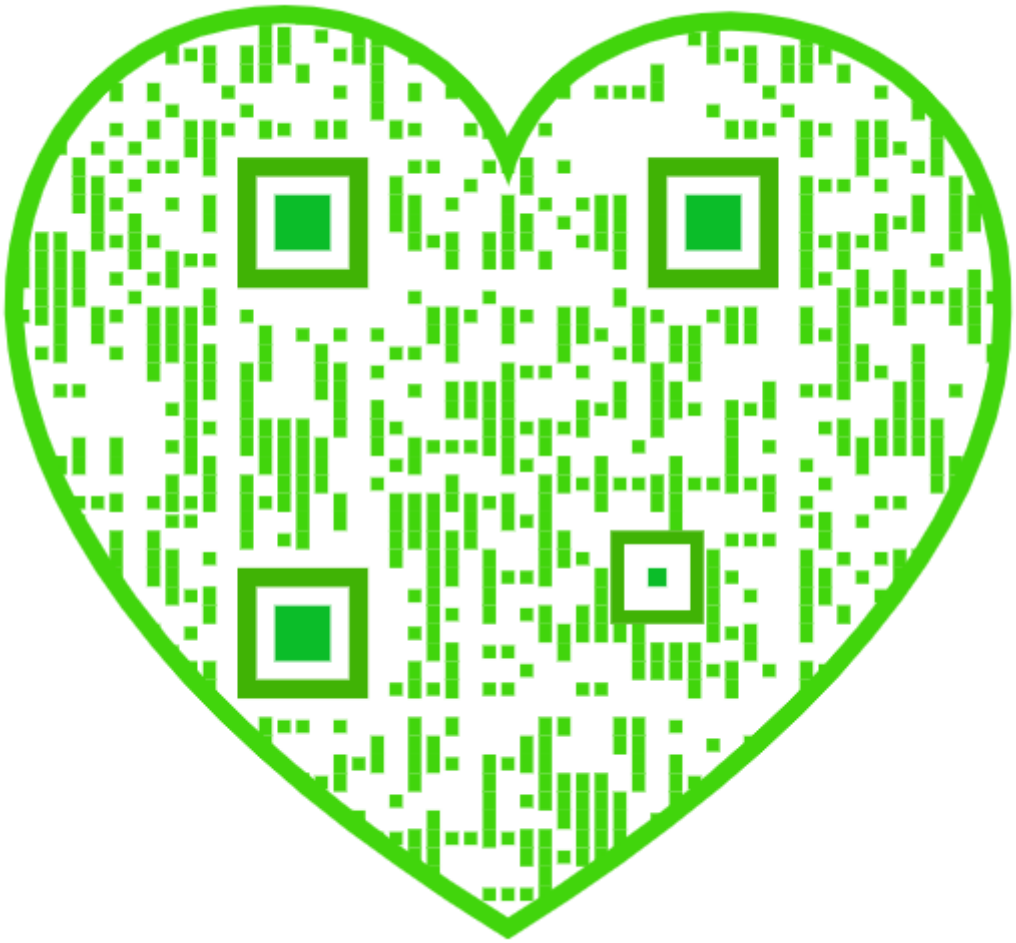

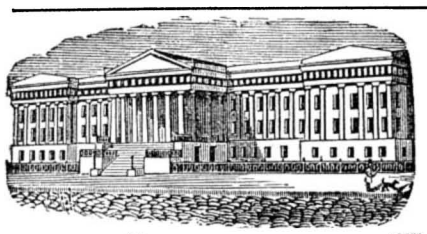

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING AUGUST 12, 1856.

CORN SHELLER—Calvin Adams, of Oak Hill, N. Y.: I claim alternating the annular rows of rotating teeth of the shelling cylinder with stationary toothed rings, when the said shelling cylinder is combined with a rack composed of a series of self-adjusting toothed segments, substantially in the manner set forth.

WASHING MACHINE—D. L. Allard, of Rokeby, Ohio: I claim, in combination with an endless apron, D, for conveying the clothes to be washed, the series of rotating pounding balls, b b, the whole being operated substantially in the manner, and for the purpose set forth.

INVALID SUPPORTERS—J. T. Alston, of Raleigh, N.C. I claim hinging the cushioned back thereof to the central connecting cross piece, k, of its base frame, when the side pieces of said frame, in front of said cross piece, are left open for the reception between them of an invalid to receive the benefit of the back and arms of said supporter, substantially as set forth.

I also claim connecting the arms, a a, to the base frame of the supporter in such a manner that either of said arms can be readily detached from said frame, and be confined therewith again, when the said base frame is left open in front, and is combined with the back of the supporter, substantially as set forth.

I also claim combining the recessed flaps, o o, with the arms, a a, of my improved invalid's supporter, when the said arms are arranged in conjunction with the base frame, and the back of the supporter substantially as set forth.

OIL FROM CANNEL COAL—Luther and William Atwood, of Waltham, Mass.: We are aware that oils for lubrication have before been obtained from coals, bitumens and schists, which afford paraffine in distillation, and they have been purified by acids and alkalies. These oils are solutions of paraffine in light oils or eupione, obtained in the first distillations; deriving their density and essential qualities from the paraffine. They do not resemble the heavier, uniform oils, which result from the decompositions and recompositions taking place in the same distillates at high temperatures aided by chemical agents applied in large quantities, at different steps in the manufacture, and we disclaim such oils.

We also disclaim mixed crude products heretofore obtained by distillation from schists, &c., and confine ourselves to a transparent nearly colorless oil, having its boiling point above 600 degs. Fah., remaining fluid at 32 degs. and of a density above 0·864 at 60 degs. which is formed from coals, bitumens, and other bodies affording paraffine, in their treatment by the above processes.

We claim an improved oil obtained by the processes substantially as set forth, from natural bodies, which alone or when mixed, afford paraffine in destructive distillation, and which oil possesses the properties described.

OIL FROM BITUMENS—Luther and William Atwood, of Waltham, Mass.: We are aware that solid bitumens have been used to produce light naphthas by distillation and the residuums for cements. Heavy acid oils have also been known as products of their decomposition.

We disclaim the production of such bodies, and confine ourselves to the use, as the basis of our manufacture, of such bitumens as do not produce paraffine, which we decompose by the aid of high temperatures conjoined with chemical agents, so as to obtain a nearly colorless and odorous oil, boiling above 600 degs. Fah., remaining fluid at 32 degs., and having a density as high as 0·900 which the above described processes will produce.

We do not claim these processes, although they are the result of a large experience.

We claim the manufacture and use of the oil having the characters described, from bitumens which do not yield paraffine by distillation.

MOWING MACHINE—Ephraim Ball, of Canton, Ohio: I claim the lock fastening for such cutter bar, made by the removed and upset portions of the brace and the extremity of the cutter bar, as set forth.

ODOMETERS—Smith Beers, of Naugatuck, Conn.: I do not claim the use of a simple spiral spring, for communicating motion from one shaft to another, forming an angle with it.

But I claim the flexible connecting shaft, T, composed essentially of a chain, U, and spiral spring, V, or their equivalents, arranged and operating substantially in the manner and for the purpose set forth.

STEERING APPARATUS—J. W. Drummond, of Norwalk, Conn.: I do not claim a sector attached to the rudder head, acted on by a pinion, as this has before been done.

But I am not aware that a two wristed or leaved pinion, actuated by the steering wheel, has ever before been so applied in connection with the aforesaid sector, that the two wrists or leaves of the pinion can be placed on the plane of motion of the sector, and thereby avoid all tendency to turn the steering wheel by any surge or wave against the rudder, and also in connection with said two leaved or wristed pinion, I make use of a spring or its equivalent to hold the wrists of said pinion on the desired plane.

I claim arranginging a pinion having two leaves or wrists in such a manner relatively with the sector or wheel acting on the rudder, that the said wrists or leaves can be turned into the plane of motion of said sector or wheel, to prevent motion to the steering wheel by any surge or wave against the rudder, as specified.

And in combination with the aforesaid two wristed or leaved pinion, I claim the T-headed rod and spring, K, or their equivalents, to tend always to bring the said two wrists or leaves into the plane of motion of the sector or wheel, substantially as specified.

ACCORDEONS—Anthony Faas, of Philadelphia, Pa.: I claim the sliding and perforated board, e, when the said board is combined with the perforated board, d, in such a manner as to produce the effects substantially as set forth.

I also claim the double keys, b c, constructed and operating in the manner and for the purpose specified.

FILTERING SAND FOR CIDER—Ira Holmes, of Leicester, N. Y.—I do not claim making cider from apples. Nor do I clam simply evaporating cider by boiling.

But I claim the described discovery and process for making a beverage and syrup from the juice of apples, as set forth.

OPERATING FARM GATES—Chester Hunter and N. Isham, of Norwalk, Ohio: We claim the bars J J, spring K, groove I, and clasps C D, when arranged as described and for the purpose set forth.

COAL HODS—C. F. Kneeland, of Buffalo, N. Y.: I do not claim the combination of wood and iron or other metal in any construction whatever.

But I claim a coal hod with a wood and metal bottom made and secured in its place, substantially in the manner set forth.

PAINT COMPOUNDS.—Frederick Kuhlmann, of Lille, France:—I claim the admixture of silicate of alkali, in substance with a paint, varnish, ink, or dye, instead of using it in layers or coatings, as heretofore done, using for the protection of the several individual coloring matters, such agents as are known to scientific or practical chemists, and which I have described.

ATTACHING INKSTANDS TO DESKS—L. R. Satterlee, of Rochester, N. Y.—I claim attaching inkstands to desks or tables, by means of the base plate, B, cup, C, and screws, S S, substantially as described.

FILES—G. W. Ramsay, of New York City: I claim constructing flat files in pairs, or with right and left cutting edges or corners, as described. Also in making the grooves to run in the manner described, in combination with said files, all substantially as set forth.

DIES FOR SCREW BLANKS—C. R. Gardner, of Detroit Mich.: I claim the elevation, a, and the slope, b, each, substantially as described, and for the purposes specified.

SHEET METAL WARE—Theo. Gomme, of Chas. E. A. Beaugrand, of Paris, France: We claim the use of the rod, f, sliding within the stamping puncheon, f, for giving motion to the plate, f, on the upper part of said puncheon, so as to hold the work in place, and subsequently to disengage it; the whole operating for preserving the thickness of the metal uniform when acted upon by the puncheon between the grooved and bevelled rings, as described.

FRUIT BOX—J. W. Hayes, of Newark, N. J.: I claim the combination of the two pieces of veneering, A and B, with the notches or slots, a a a, and the longitudinal openings, c c, interwoven at the center, bent at right angles and secured together by the cord, e, in the slots, a a a a, as described and for the purpose mentioned.

FIRE ARMS—F. W. Hoffman, of New York City: I claim so combining the cap, b, with the cock, that the opening and closing of the end of the barrel shall be effected by the act of cocking the piece, substantially as set forth.

ARTIFICIAL STONE—St. J. Ravenel, of Charleston, S. C.: I claim the described substitute for stone, marble, or brick, produced substantially in the manner set forth.

FELTING HAT BODIES—E. R. Barnes, of Brookfield, Conn., and J. B. Blakeslee, of Newton, Conn.: We claim the peculiar arrangement of suspending and rendering elastic and adjustable the endless rotating bed of felting machines substantially in the manner described, so that it may be elevated or depressed, while in operation, and at the same time possesses an oscillating motion in order to adapt itself to the varying stages of the process of felting.

NAIL PLATE FEEDING APPARATUS—Adolphus Heddaens, of Pittsburg, Pa.: I claim, first, connecting the feeding apparatus with the nail machine, by ball wrists or universal joints, in some point or points situated in a vertical line through the center of the nail, when cut, and of locating all the points of such connection in this vertical line, for the purpose of giving the feed apparatus a lateral motion in the arc of a circle, whose cutter is in that vertical line, whereby the feed apparatus may be accurately adjusted, without stopping the operation either of the feeder or the nail machine.

Second, the use of an elliptical spring or steel hoop, as the bearing for the other front end of the screw, in combination with the sleeve, s, ball, a', cam, f', and spring, g', for the purpose of allowing the turning of the nail plate, and drawing it back while turning.

Third, the use of the large wheel, G, constructed as described, in combination with the pawl, t, and pinion, p, for the purpose of communicating the requisite motion to the feed screw and nail plate, together with the cam wrench, l' to lower the spring, b', of the pawl, t, whereby the feed apparatus may be instantaneously stopped, without interfering with the action of the nail machine or detaching the one from the other.

FIRE ARM—F. D. Newbury, assignor to R. V. Dewitt, of Albany, N. Y.: I claim the releasing spring, T, to throw the arm, D, promptly down, to permit a re-charge of the piece.

I claim the concave breech seat, M, or its substitute. I claim the method of arranging the tape priming, by inserting the same through the stock. in the manner described, either without metal priming, J K.

I claim the spring, s, when applied to the stock, to prevent the retraction of the tape, and to cover the priming from the weather, arranged substantially as shown and described.

I claim the feeding spring piece, p, in combination with the lever, D, as its moving power.

FIRE ARMS—A. N. Newton, of Richmond, Ind.: I do not claim the self-adjusting thimble, constructed and operating in the manner set forth in J. D. Green's patent June 27, 1854.

Neither do I claim a sliding collar on the breech, forced against the end of the barrel by a spring acting on the trigger, as in J. C. Daye's patent, Dec. 18, 1855.

Nor do I claim a cone-headed pin, and five or more expanding rings in combination with a radial breech, as in B. F. Joslyn's patent, Aug. 28, 1855.

Nor do I claim inserting a metal ring into the slide, with a chamber in the rear of said ring, as in H. Conant's patent, April 1st, 1856.

But I claim two or more expanding bands, as shown and represented, in combination with the chamber and sliding breech pin, completely overlapping the joint between said breech pin and chamber, substantially in the manner and for the purpose described.

SASH FASTENER—Wm. Patton, of Towanda, Pa.: I claim the described supporting and self-locking sash fastener, composed essentially of the plate. B, bolt A, and catch, n, when said bolt is arranged in an upright position, and hung forward of its fulcra, so that its whole weight shall tend to throw it into the catches, the whole being constructed and operating together and in the manner and for the purpose set forth.

GOLD WASHER AND AMALGAMATOR—W. S. Pierce, of North Attleborough, Mass.: I claim constructing the washer, or separator, substantially as described, viz., having the furnace, B, placed with the case, A, which has oblique or taper sides, the ledges or plates, a, placed on the top plate of the furnace, and the screen, C, and the sponge E, which is fitted between the screens, D, placed in the case, A, the whole being arranged as shown for the purpose specified.

SPRING PULLEYS FOR WINDOW SHUTTERS—John Shopland, of Honesdale, Pa.: I claim, in combination with the pulley and spring, the self-acting compensating brake for holding the pulley at any fixed point, regardless of the increased power of the coiled spring as it is wound up in drawing down or raising up a sash, door, or other thing to which it may be attached, substantially as described.

THROWING PROJECTILES—A. B. Smith and William Weaver, of Clinton, Pa.: We claim the conformation of the ring which encloses the revolving disk with a movable muzzle, in the manner and for the purpose specified.

We also claim the spiral tube, E, for gradually communicating the motion of the disk to the balls when its outer end is turned radially (or thereabout) outward, and is provided with a valve in said radial portion, substantially in the manner and for the purposes set forth.

We also claim the mode of opening the valve, o, substantially as described, whereby the balls are invariably brought to the ring, A, at a given point, and that point changeable at pleasure, irrespective of the position of the ring relative to its disk, or of the point to which it may chance to be directed.

We also claim the employment of the cam, j, in the manner and for the purpose described.

MANUFACTURING CHAIRS—Edward Q. Smith, of Cincinnati, O.: I claim the arrangement of the sliding table, 5, in combination with the cutter head, 3, and cutters, 8 and 9, furnished with the adjusting piece, 6, for holding the pillar to its proper relative position to the cutter head or equivalent means for making the top of the pillar the desired form and size to fit the dovetail in the chair back.

TREATING INDIA RUBBER—Wm. F. Shaw, of Boston, Mass.: I claim the treatment of sulphured rubber or gutta percha with unsulphured drying oils or unsulphured ruber or percha with sulphured drying oils, in the manner set forth.

LETTERING AND ORNAMENTING GLASS—Jerome B. Shaw, of Pittsburgh, Pa.: I have been informed that in the invention of each of the parts of the foregoing process I have been anticipated by others, except in the use of metallic foil patterns of the shape of the design, cemented to the glass while the ground is being painted; and that paper patterns have been used to paste upon cloth while painting the ground of transparent designs thereon. I therefore make no claim to any of these things in the invention of which I may have been anticipated.

But I claim in the described process of ornamenting glass the employment of patterns of metallic foil, and cementing the same to and removing them from the glass, as set forth, whereby I am enabled to produce ornamental designs on glass at a greatly reduced cost.

PLANING METAL—Chester Van Horn, of Springfield, Mass.: I claim supporting the cross slide, F, by means of the uprights, B B, with the beam, D, fitted between them at one side of the bed plate, A, and framing, C, and having either one upright, E, or two at the opposite side of the bed plate and framing, substantially as described for the purpose set forth.

CORN HARVESTERS—Andrew Sprague, of Coldwater, Mich.: I do not claim the tongue, steering wheel, and the drive wheels and elevators.

But I claim the guard, K, in combination with the knives, A, operated in the manner and for the purposes set forth.

HAT BODIES—Alvah B. Taylor, of Newark, N. J.; I claim regulating the distribution of the fur or other stock upon the perforated cone, by varying the feed of the picking cylinder at different parts of its length.

EXTRACTING STUMPS—Wm. O. Thompson, of Orange, Mass., and Leonard Harrington, of Worcester, Mass.: We do not claim the use of a lever and pulleys, or their application to our machine.

But we claim the combination and arrangement of lever, A, and gallows frame, I, in connection with the pulleys or power applied, when constructed and operating in the manner and for the purposes set forth and described.

SPINNING FRAMES—Thomas W. Taylor, of Cannelton, Ind.: I claim the construction, arrangement, and driving of the flyers of fly frames, in combination with either a live or dead bobbin spindle, as the case may be, substantially as set forth.

VALVE GEAR FOR STEAM HAMMERS—Charles W. & John P. Willard, of Dorchester, Mass.: We claim the combination of the bent rocker lever, I, the actuator, L, and the two adjustable cams, O P, the whole being applied together, and to the valve rod and trip hammers, substantially as described.

ROCK DRILL—George H. Wood, of Green Bay, Wis.: I claim the combination of the hooked pitman, crank, and strap, when arranged as described, as a mechanism for lifting the drill, substantially as set forth.

BLAST FURNACE—Wm. Wright and Geo. Brown, of New Castle, Eng.: We claim the general arrangement and construction of cupolas and smelting furnaces for the self-heating of the air blast by the arrangement of the chambers and air passages, as described.

SEPARATING SILVER FROM TIN ORE—Wilhelm Ziervogel, of Freskow, Pa.: I claim the application of water or a solution of sulphate of copper slightly impregnated with sulphuric acid instead of lead, quicksilver, or salt, hitherto used for this purpose to the process of separating silver from copper and other ores, rendering thereby this separation easier, shorter, less expensive, and not noxious to the health of the operator.

WRINGING CLOTHES—Robert P. Bradley, of Cuyahoga Falls, O., assignor to Joel Wisner, of East Aurora, N. Y.: I claim the construction and arrangement of the springs, c c, so as to compensate for shortening in the act of wringing, and at the same time form posts at the sides for bearings.

CHIMNEY COWL—Geo. W. Thatcher, of Philadelphia, Pa.: I claim the introduction of one or more central tubes, with their caps or frustums enclosed within an outer tube with its cap or frustum, and extending downwards within the outer tube, so as to increase the upward draft, and afford protection from winds and storms.

ORE WASHER—Hezekiah Bradford, (assignor to Horatio Bogert,) of New York City: I claim the employment of a hollow perforated cylinder rotating on horizontal or nearly horizontal axis, provided with numerous pins or teeth on the inner periphery pointing towards the axis combined with a feeding aperture and hopper at one end, and lifting scoops and delivery aperture at the other end, and with a water trough or vessel, within which the lower part of the said cylinder revolves, the said trough or vessel being provided with a delivery aperture controlled by a valve, all substantially as and for the purpose specified.

REFRIGERATORS—Thaddeus Fairbanks, (assignor to John C. Schooley,) of St. Johnsbury, Vt.: I claim so combining an ice receptacle with the interior of a refrigerator as that a continuous circulation of air shall be kept up through the ice in said receptacle, and through the interior of the refrigerator, and so that the circulating air shall deposite its moisture on the ice every time it passes through it, and be dried and cooled, and passed through the interior of the refrigerator, substantially as set forth.

BRICK MACHINES—Isaac Harman, (assignor to himself and Wm. Beckett,) of Tamaque, Pa.: I claim the molds composed of two halves, N and N, having any convenient number of angular projections and recesses the points of the angular projections of one half coinciding with those of the other half, the said molds being caused to expand and contract, and being constructed and operated substantially in the manner and for the purpose set forth.

VAPOR BURNING LAMPS—Samuel Whitmarsh, of Northampton, Mass., and Wm. J. Demorest, of Orange, N. Y.: I do not claim the principle of increasing the intensity of combustion or flame by an admixture of atmospheric air, as that has long been known and used.

But I claim the method of heating the air supplied through the air holes in the outer cylinder, R, in the space between the cylinders, H and I.

RE-ISSUES.

PHOTOGRAPHIC PICTURES ON GLASS—James A. Cutting, of Boston, Mass. Patent dated July 11th, 1854: I am aware of the previous use of balsam for the cementing of lenses and the securing of microscopic objects, and other like purposes, and do not therefore extend my claim to any of these uses.

But I claim the combination of balsam or its equivalent with positive photographic pictures on glass, and with the additional glass, by which they, with the balsam, are hermetically sealed, as described, and for the purposes set forth.

APPLE PARERS—Charles P. Carter, of Ware, Mass. Patent dated Oct. 16th, 1849; I lay no claim to the invention of the combination of a rotating holder or shaft, and a knife fixed to a bar, whose movements in order to keep the knife against the surface of the apple during the operation of removing the peel are directed by the hand of a person applied to it.

But I claim, first, the combination of the spiral groove, i, the rack bar, P, and sector, O, or their equivalents, for the purpose of moving the knife automatically, in the manner and for the purpose set forth.

Second, I claim the combination of the spiral groove, i, the lever, R, and the sliding bar, W, or their equivalents, constructed and operating in the manner substantially as described, for the purpose of throwing the apple from the prongs after the paring is completed, as set forth.

Third, I claim giving to the knife a slight play around its axis, independent of the mechanism which actuates it for the purpose set forth.

WROUGHT IRON R. R. CHAIRS—Wm. Van Anden, of Poughkeepsie, N. Y., assignor (through others) to Alexr. Frear and Jacob Rowe, of New York City. Patented April 13th, 1850: I claim, first, the combination of two or more properly shaped dies, between which a chair blank is clamped, prior to the cutting of that portion of it which constitutes the lips thereof, substantially in the manner and for the purposes described.

Second, I claim automatic shears, in combination with properly shaped dies, for clamping a chair blank and cutting the lips thereof, substantially as set forth.

Third, I claim such shears when they also act as benders to complete the formation of a chair lip, by reason of their having a motion in two directions, substantially in the manner specified.

Fourth, I claim the double or parting clamp and die, substantially such as is described, so that a chair may be removed from the die upon which it is formed, as set forth.

Fifth, I claim discharging a chair from a double or parting die, or its equivalent, by kooks or their equivalents, acting to shove the chair off of a die, substantially as described.

Sixth, I claim in combination two clamping dies, one of which acts as a former and divides at proper intervals, shears which also act as benders, or their equivalents, and a discharging apparatus, acting in respect to each other, substantially in the manner and for the purposes set forth.

Great Feat of Swimming.

A man named Jackson recently swam across the Niagara river a short distance below the Falls. Such a feat never was performed before. It was one of great daring, as the water rushes down with tremendous velocity, and agitates the ferry boats which cross at that spot with great violence. He must be a man of great strength, endurance, and boldness, as well as an expert swimmer.

New Coal-Burning Locomotive.

The New Jersey R. R. and Transportation Co., has recently placed a locomotive, using Cumberland coal for fuel, upon their road, and on the 14th inst. we made a trip to Newark and back, for the purpose of witnessing its operations.

It was built at the well-known establishment of Wm. Mason & Co., Taunton, Mass., and is a fine specimen of engineering skill and mechanical workmanship. In appearance it is nearly similar to the Taunton eight-wheeled wood burners. Its drivers are 5 1-2 feet; cylinders 15 by 22 inches, placed horizontal, with ports 14 by 1 1-8 inches. The valve gear has the link-motion, and the working devices are somewhat peculiarly arranged; the exhaust is 4 inches in diameter. The engineer and fireman stand as in wood-burners.

The new and important feature of this locomotive is the boiler, which is the invention of H. Boardman, No. 11 Wall st., this city, the object of which is to burn bituminous coal as fuel, and produce perfect combustion—no smoke nor sparks—and effecting a great saving in the expense for fuel. The boiler is placed in a frame in the usual manner; the furnace has a grate 5 feet 6 inches by 3 feet, and is enlarged at the top, and extends over the whole length of a series of vertical tubes (horizontal tubing is employed on all common locomotives) which occupy a space between the forward drivers and the truck. This tubing forms the bottom portion of a descending flue of a large area, which is continued from the bottom of this part of the boiler to the smoke arch in front. It also forms a low box entirely underneath the common boiler proper, and serves as a counterbalance to the boiler and machinery above, and gives great stability to the engine while running. The ends of the tubes are also placed where they do not come into contact with the intense heat of the fire-box. By this arrangement of furnace and tubing a large combustion chamber is provided at the top of the fire-box, which is supplied with a jet of warm atmospheric air by a pipe running from the outside of the smoke arch backwards, and distributing the air among the hot gases from the furnace. This jet of warm fresh air checks the too rapid escape of unconsumed gases (smoke) and supplies them with oxygen, and they ignite, producing perfect combustion. This arrangement embraces the true philosophic principle of consuming smoke.

Excepting for a second or two, when fresh coal was fed to the furnace, we witnessed no smoke escaping from the stack. It carries no spark-arrester, for none is required; sparks—that abominable nuisance to passengers on wood-burning locomotive trains, are annihilated in this engine. The supply of steam at 100 lbs. pressure was easily maintained, and with a large train we timed it for a short distance, and the speed was at the rate of 60 miles per hour.

An engine of the same kind has been running regularly on the Providence and Worcester Railroad since October last, and has, we understand, given great satisfaction for economy of fuel and durability of all its parts.

A coal-burning locomotive for running all kinds of trains—passenger and freight—is no longer an experiment, it is a successful achievement. Patents have been secured for it in England and other countries through the Scientific American Agency, and it will, no doubt, yet be adopted on the railways of the Old World.

Railroads in Texas.

A Bill authorizing a loan by the State, to construct railroads, has passed the Texas House of Representatives.

The amount of loan is fixed at $6000 for every mile of railroad constructed. The object of this policy is to encourage the people to invest their money in, and to construct railroads, which appear to be so necessary for the growth and developement of this immense State.

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The Sun.—No. 5.

[Concluded from page 363.]

MESSRS. EDITORS—It may be asked, what is the nature of the luminous coating of the sun? Is it a liquid or a gaseous substance which is susceptible of such agitations? When we consider the vast changes which are going on in this stratum—chasms having many times the area of the earth's surface opening and closing again in a few weeks, or even days—it must be admitted that it has an extreme mobility, and a tenuity which seems incompatible with any other state of matter besides the atmospheric or gaseous. That it is a gaseous substance may no longer be left to the domain of mere conjecture. By the experiments of recent physical inquirers—foremost in the list of which we must place the name of the late and distinguished M. Arago, of France—combined with observations on the solar disk, we are indisputably shown that the luminous matter of the sun is gaseous in its properties, Two kinds of light, natural and polarized, are known to philosophers. When a luminous body, whose light is natural, is viewed with an instrument called the "polarizing telescope," two equally luminous and perfectly white images of the body are seen; but if its light is polarized, these images appear no longer white, but tinged with complementary colors. It has been proven that if the light of the sun proceeded from a solid or liquid body, that its margin must present marks of polarization by giving colored images in the polarizing telescope; but if it comes from a gaseous body it must be in its natural state. Repeated observations on the sun show that his light is unpolarized, and gives perfectly colorless images in the polarized instrument. Hence his light is in the state of that of an incandescent gaseous body.

The facula and luculi are probably caused by portions of the uneven photosphere, like flakes of clouds, being inclined so as to be seen very obliquely or edgewise, which thus appear more brilliant than the surrounding and less inclined portions. They, too, like the dark spots, denote constant changes going on in the photosphere of the sun.

We have strong evidence of the existence of a solar atmosphere of no inconsiderable hight, exterior to the photosphere. This atmosphere is generally invisible in the glow or radiations which appear to surround the sun, and are caused by the reflection of his light on the particles of our own atmosphere. The effects of his atmosphere which is not perfectly transparent, may be observed in the light from the different parts of his disk. The disk is found to be less luminous near its borders than at its central parts; the reverse would certainly be the case was he not surrounded by an absorbing atmosphere, whose effects would naturally be much stronger on the light from near his margin. But the phenomena of his atmosphere are much more striking and conclusive during total solar eclipses. When the moon entirely covers the face of the sun, whose rays can no longer meet our atmosphere above the observer, she is uniformly seen to be surrounded by a bright halo of light, which gradually fades away at some distance from the lunar orb. It has been proven that the moon has no surrounding atmospheric medium capable of producing such a phenomenon; hence, this glare of light must be the reflection of the solar rays from the particles of his own atmosphere.

Other more curious phenomena are often observed during solar eclipses. Just as the advancing edge of the moon has completely covered the solar disk, numerous rose-colored jets are seen to dart forth, as it were, from the dark edge of the lunar orb, sometimes attaining a hight of 3 or 4 minutes. Several opinions have been advanced for the purpose of explaining the cause of these strange appearances. The theory which appears most compatible with observation is that which regards them as very attenuated clouds floating in the solar atmosphere and reflecting his light. Their outlines are usually serrate or irregular, and recently, in one or two instances, they have been observed to be entirely detached in appearance, from the edge of the moon. This shows that they are nothing which rest on the surface of the sun, like lofty mountains, but rather float above this surface, and even high above his photosphere. Taken for clouds near the sun, they must often be of great dimensions, some ranging from 70 to 90 thousand miles in length.

It is evident that the temperature of the sun's photosphere cannot be otherwise than very elevated. It must be infinitely more so than any artificial heat which can be produced. We know that the intensity of light and heat decreases as the second power of the distance increases. From this it has been computed that the heat of the solar rays at his surface is no less than 300,000 times their temperature at the distance of the terrestrial globe. [See Herschel's Outlines of Astronomy, Art. 396, for an elucidation of the temperature of the photosphere.] A much less degree of condensation of the solar rays by lenses or specula will suffice to dissipate the most infusible metals, in vapor. The most vivid flames and strongly ignited solids, when projected in perspective on the solar disk, appear like black spots, so intense is his radiation. From this, it appears that although the body of the sun seems to be black through the openings in his luminous covering, yet was his photosphere removed he might be quite luminous; but this is not necessarily the case. Notwithstanding that the temperature of his photosphere is so elevated, that of the solid globe of the sun may not be very great; for, as we have seen, it is shielded from the radiation of his luminous and calorific envelope by a thick cloudy stratum. If this cloudy stratum, which is supposed to rest on a highly elastic gaseous medium of great density, is exceedingly reflective, (were it otherwise, we should be unable to perceive it as a penumbra about the spots) we may with good reason suppose that the body of the sun receives but a little more heat from his luminous atmosphere than we do on the surface of the earth.

The quantity of heat which the sun gives out into the surrounding space during one year is enormous. This immense radiation, however, does not appear to diminish the intensity of his rays in the least during any period of time; therefore some powerful means of keeping up a continual and generally equally incandescent state of his photosphere must exist in his system. By what means this is effected physical researches have hitherto fallen far short of pointing out. We cannot even conjecture the cause with any degree of probability. Of all the agents which we know, the one which would be more probable to maintain such a constant phenomenon is electricity or magnetism. The phenomena of this agent on the earth, the *aurora borealis* and the like, sink into comparative insignificance beside the immense physical operations of the solar photosphere.

The solar rays go far in influencing terrestrial phenomena. By their agency, winds and circulations of air are produced; watery vapors are raised aloft and wafted over the land, falling again as rain, sleet, hail, and dew; and vegetation is brought forth, cherished, and attains to maturity. By their means are caused the dawning aurora and evening's *crepusculum*, the solar and lunar halves, and the brilliant *parhelia*, the golden hues, and the scarlet tinges of the clouds, the azure of the sky, and the beautiful rainbow. They give the green tinges and beautiful colors of the vegetable world, and cause their odors and resinous effusions. The currents of the ocean and electrie phenomena of the clouds, as well as many other operations, are dependent wholly or in part on their presence.

STILLMAN MASTERMAN.

[For the Scientific American.]

Slate Roofing.

In the SCIENTIFIC AMERICAN of June 14th you say you have recently received a number of letters requesting information respecting a good and cheap material for roofing houses, then follows some remarks relative to cement, tin, &c., while slate are merely named, and passed in silence.

I would therefore beg the privilege of saying that in this vicinity roofing slate are being quarried which, I believe, possess every quality of the Welsh Bangor quarries, and when the durability and safety are taken into account I believe a roof will be found to be cheaper than any other material. I was shown a roof two years since that had been on 100 years, at least, the dwelling was built in 1754; the slate was still unimpaired, and may last 200 years more; the building was to be taken down and the slate to be relaid.

The slate can be furnished on board cars on railroad here for $3·50 per square, that is, 10 feet square when laid on the roof, and transported to New York for $1 per square, to Buffalo for $1·83.

The expense for laying is about the same as shingles, and can be laid as easily and by the same workmen. The roofing-boards are put on the same as for shingles, and when the slate are on, shelter from fire, rain, or snow, so far as the roof is concerned, may be found during several generations; being tighter than shingles slate never shrink or swell, and these slate do not absorb water, therefore heat or cold does not affect them. GEO. N. BATES.

Middle Granville, N. Y., Aug., 1856.

[The letter of our correspondent surprises us. We have on more than one occasion recommended slate for rooofing, as being the best fire-proof material for this purpose; but we did not class it among the materials for cheap roofing in the articles which recently appeared in our columns on the subject. He, however, makes it to be a cheap roofing material—even cheaper than tin, the cost of which is $7·50 per square for common plate, $8 for charcoal plate, and ranging from $9 to $10 for that of superior qualities. The roofs for slate require a greater pitch than for tin, and also stronger framing; but the framing of most of the stores built in this city, we presume, is strong enough. He is mistaken in supposing that slate can be laid on roofs with as great facility as shingles; they require a great deal more care and skill.

Boucherie's Process for Preverving Wood from Decay.

A number of cotemporaries have recently published extracts from the Report of the French Exhibition, setting forth the advantages of Dr. Boucherie's process for preserving railroad sleepers, telegraph posts, &c., from decay, but these extracts do not describe, but rather mystify the process.

About eighteen years ago Dr. Boucherie, of France, suggested the application of the aspirative force of trees for the rapid and more perfect impregnation of wood, with some antiseptic, to prevent its decay. His plan consisted in taking a tree recently felled, and placing its base or butt in a bag of india rubber fastened tight around its mouth, but connected at its bottom by a pipe with a cistern or reservoir containing the preserving liquor.

The best season of the year, according to Dr. Boucherie, to impregnate trees in this manner, is the autumn. The principle of action taken advantage of, is that of the flow of the sap from the root by the innate force of the tree. About the same time that Dr. Boucherie suggested and tested this method in France, John Bethnell, in England, took out a patent for an identical process, in July, 1838.

When Boucherie published his process, a Commission of the French Academy of Sciences, appointed to investigate its merits, reported very favorably of it; this committee consisted of such distinguished men as Boussingalt, Arago, Poncelet, and Audouin.

This process was afterwards improved by Dr. Boucherie, by elevating the base or butt of the tree uppermost, and it is by this method that the sleepers and telegraph posts were treated, which are spoken so highly of by the Jury of the French Exhibition.

The newly felled tree is stripped of all its superfluous branches and divided into convenient lengths, and the preserving liquor applied in the india rubber bag at the butt, at the uppermost part of the tree or log—if cut into logs. If the butt is scooped out like a bowl, to hold the liquor, the india rubber bag is not required to hold it, but more liquor must be supplied as it forces itself down through the pores of the tree. In most cases the liquid penetrates rapidly, expelling the sap before it, by its gravity, and the operation is terminated whenever the liquor, which flows out at the bottom, is similar to that at the top.

Some trees are more difficult to impregnate than others; the most porous are not always the easiest.

This process is not so applicable to seasoned timber, the pores of which should be exhausted of air by an air pump, and the preserving liquor applied under pressure.

The pyrolignite of iron was the first antiseptic employed by Dr. Boucherie, but he now uses the sulphate of copper.

In the year 1846, 80,000 sleepers thus prepared, were authorized to be laid down upon the Northern Railway of France, together with a certain quantity of unprepared sleepers. In this instance, the Company chose wood that decays easily, and which, on that account, had been rejected for durable works.

These sleepers were inspected every year, and each time were found in a good state of preservation.

The following is an extract of a report upon the subject addressed to the jury of the late Exposition, by the administrators of the Northern Railway of France:

"The sleepers prepared by Dr. Boucherie's process are preserved in an absolute manner, it being impossible to foresee a limit to their duration, seeing the present perfect state of preservation exhibited by those sleepers laid down eight years ago.

Since the year 1853, the Northern Company has ordered more than 300,000 sleepers prepared by this system, and further orders would have been given, if they had found contractors disposed to deliver upon the same terms; however, at the present time tenders are required for more than 200,000 of those sleepers."

The following is an extract from De Vougy, Chief Administrator of Telegraphs in France, on telegraph posts:

"PARIS, August 14, 1855.

Sir:—All the telegraph posts in the French Empire have been prepared by your process. The administration had 200,000 on the 1st of January last, and since that time have caused 32,000 additional posts to be prepared. The preservation of the posts thus injected with sulphate of copper is rendered complete, although the first were prepared and laid down in the year 1848."

This method of preserviug timber is very simple, and can be carried into practice at a small expense in our forests, where the trees are felled and sawed into logs.

For railroad sleepers, timber so prepared would effect a very great saving of expense to all our railroads. In Lowell there is a factory for preserving timber by the use of a solution of chloride of zinc (Burnett's process,) which is a good preservative, but this is the only factory of the kind, we believe, in our country, thus showing that there is but little demand for preserved timber; and that our railroad companies are not yet sufficiently impressed with a true sense of its economical value.

Boucherie's process is public property; logs may be impregnated on his principle, if set at angle butt up, and not perfectly vertical, so that a cheap staging may be put up, and two or three men accomplish all the labor connected with it in the midst of any forest in our country.

Electro-Chemical Baths.

I notice in your journal of July 26th, on page 363, an article from Mr. Smith, who, although possibly something of a magnetist, is, to judge from his writings, very little of an electrician.

Mr. Smith does not seem to be aware that the irradiations of electricity are subject to the same laws as those of heat and light, and that a proposition which supposes that any metal folded in layers will cause as much irradiation as the same will when its whole surface is exposed, is, to say the least, an absurdity.

As well might Mr. Smith maintain that a folded or closed umbrella would be of as much protection, in warding off the rays of the sun, as the same would when opened. For an answer to the other portion of his article, I refer your readers to my article of July 6th.

New York, Aug., 1856. M. VERGNES.

Australian Gold.

No less than $100,000,000 of gold were obtained in Australia in 1855, and during the first three months of the present year no less than $30,000,000. Brother Jonathan and Uncle John appear to be in luck with regard to their gold discoveries.

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New Inventions.

Bad Steam Boilers.

The Herkimer County *State Journal* contains an account of the investigation of the steam boiler explosion which took place at a cotton factory at Little Falls, N. Y., on the 31st ult., and from the evidence elicited, we are of the opinion that it was caused by too high pressure of steam in a defective boiler. The boiler could not raise a sufficient quantity of steam to drive the machinery of the factory, and the supply of feed water for it was sometimes insufficient, and it was stopped on this very account when the explosion occurred. It was customary to carry a very high pressure of steam in order to drive the machinery, and a few days before the explosion took place, a rivet was blown out by the over pressure. James Peel, the machinist, stated that he "doubted the capacity of the boiler from the time the rivet was blown out because the iron was bad."

A terrific boiler explosion occurred on the 8th, at Wilder's Safe Manufactory, in Brooklyn, L. I., by which three persons were killed, and sixteen severely wounded.

The evidence given in this case by G. W. Stilwell also proved the boiler to be defective. The iron was very brittle, and appeared to have been burned, as if it had oftentimes been deficient in water, and red hot. From the great number of explosions which have lately taken place, it appears to us that the practice of forcing steam boilers beyond their capacity is quite common. Many owners of factories appear to be guided by the stupid economy of saving money by using boilers of insufficient capacity to drive their machinery, hence they have to submit them to intense firing and an enormous pressure, by overloading their safety valves; and when the climax of this reckless conduct is a terrible explosion, by which numbers are killed and wounded, and much property destroyed, it is called an "accident." And it happens somehow by the testimony of those concerned in such accidents, that however high the pressure may be to which such boilers are generally submitted, or though they have sometimes been red hot for want of water, that at the time of the explosion there is always plenty of water in them, and the pressure much below the running standard. We have no confidence in such testimony, for it belies itself. Common sense ought to teach the owners of such boilers that "safety is economy," for it is well known that an explosion generally destroys more property in a few minutes than would have sufficed to purchase and run boilers of sufficient capacity, and to have paid for the best skill in attending them.

The boiler at Little Falls was sometimes shamefully overloaded; it would have required two of a like size to do the work endeavored to be extorted from it, and they would have done it more economically.

There ought to be a rigid inspection carried out with all steam boilers; this would be a good method to insure more safety, but then the difficulty would be to get proper men appointed or elected to fulfil the duties of such an office impartially and intelligently.

Improved Sawing Machine.

The object of the improvement illustrated by the accompanying engraving, is to do away with the friction caused by pushing the stuff over the surface of the table, against the saw. Also to furnish a quick and easy means of removing the stuff from the table, when cut, so as to protect the operator from being injured by flying pieces.

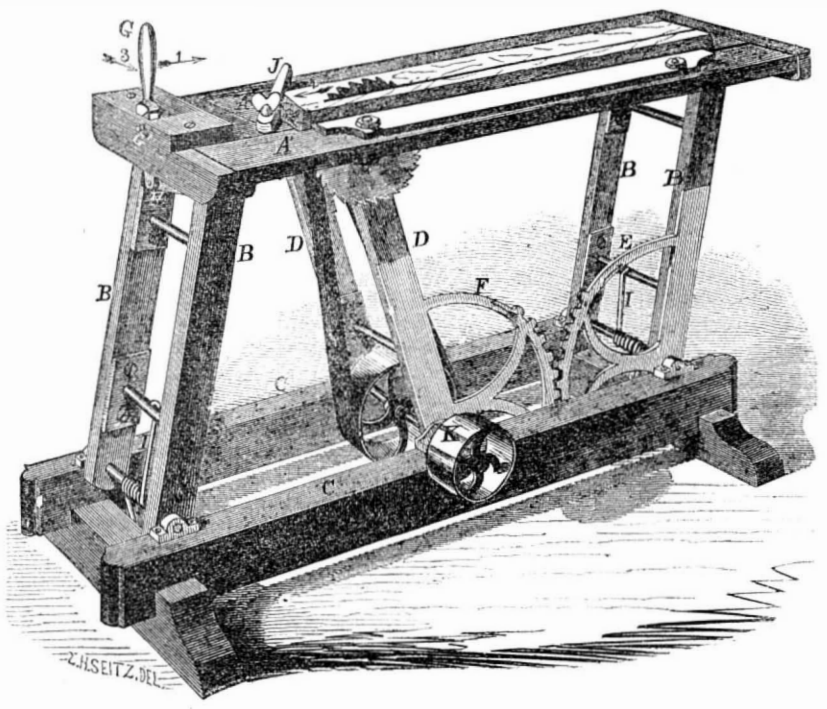
The table, A, is pivoted to the uprights. B and these are pivoted, at their lower ends to the base frame, C. The saw is sustained on a mandrel which extends across the tops of the uprights, D D. E F are cogged sectors attached respectively to one of the uprights, B, and D, and gearing together. K is a driving pulley, on whose shaft the lower ends of the uprights, D, are pivoted.

The stuff to be sawn is placed upon the table, and the operator places his hand upon handle G, and pushes the table in direction of arrow 1, causing it to lean, as shown in the engraving, and carries the stuff half its length against the saw. This movement of the table and its uprights also moves sector, E, which operates sector F, and thus causes the uprights, D, to lean just as far in the contrary direction, shown by arrow 2. The saw is thus pushed through one half the length of the stuff, thus completing the cut. The lumber or other article placed upon the table, does not require to be pushed along against the saw, and thus all friction and power necessary for that purpose is dispensed with.

The handle, G, is pivoted, and has a lateral movement in the direction of the arrow, 3.

One side of the table, A′, is hinged, and opens laterally. This movable portion of the table, A′, is connected by means of rod, H, with handle G, which is pivoted at G′. After a cut has been completed, the operator pushes handle G in direction of arrow 3, and opens A′, thus causing the piece which has been cut off, to fall through upon a rack placed below to catch the stuff. I I are springs which equalize the weight of the table and

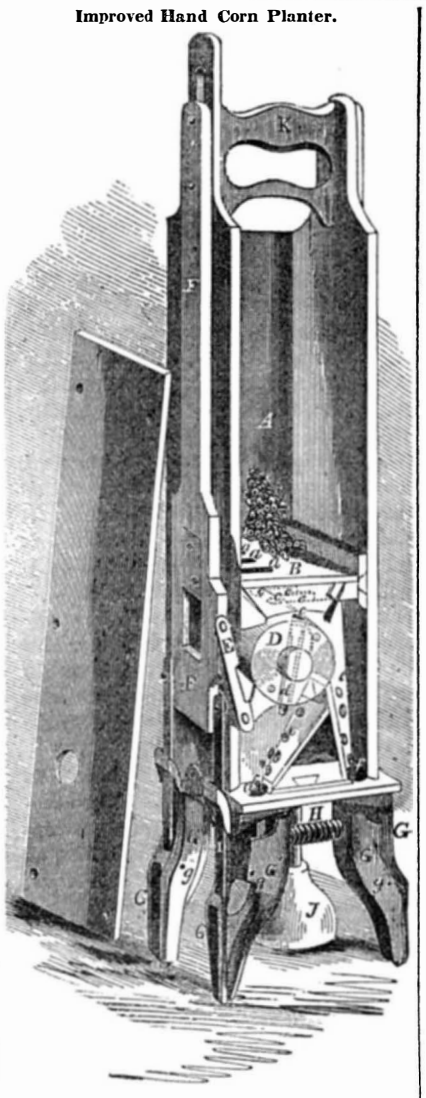
IMPROVED SAWING MACHINE.



make it vibrate easily. J is a quadrant gauge attached to the table for mitering. When not wanted, it may be quickly removed, by unscrewing its thumb button.

This machine, when constructed for sawing wood, &c., is but three feet long, and the action of the equalizing spring throws back the saw, and makes it easy to operate; it is very convenient to pack for transportation to any place, and can be set up in a few minutes. The parts are quite simple. It can be altered from cross-cut to rip, and *vice versa*, by simply changing the saws. We are informed that the invention operates with great success and gives much satisfaction. The inventor is Mr. Thomas J. Alexander, Westerville, Franklin Co., O., of whom further information can be had Patented April 29, 1856.

Improved Hand Corn Planter.



By S.L. Denny, Penningtonville, Chester Co, Pa.—This invention belongs to that class of planting contrivances which are carried in the hand of the operator, the seed being planted by thrusting the lower part of the apparatus into the ground.

Externally the machine has the appearance of a slender box supported on four legs. The legs are hollow, and the corn passes down through them to the ground. In our engraving one of the side boards is removed in order to exhibit the interior mechanism.

The seed is contained in the upper part of the box, A. B is a partition which supports the grain. It has four perforations, *a*, corresponding to the four legs of the machine. Immediately below B is a seed cylinder, D, having four pockets, *c*, to receive the seed which falls from the four apertures, *a*. The pockets, *c*, are furnished with plungers, *d*, the lower ends of which pass through cylinder D, and project from its periphery. D is united by rod E with a slide, F, and this latter is connected with the handle of the apparatus, K, in such a manner that by the act of thrusting the legs of the machine into the ground and then lifting them for a new stroke, the cylinder will be partially rotated, first in one direction and then in the reverse.

During this operation the pockets, *c*, are brought directly under the apertures, *a*, and the plungers, *d*, fall by their own gravity, so as to leave space for the reception of the seed. The rotation of the cylinder, D, being now reversed, the ends of plungers *d* come in contact with one of the sides of the machine, and are pushed up, and the seed is ejected from the pockets, *c*, into the chambers, *e e*, of which there are four, one for each leg. *f f* are apertures leading from the chambers into the legs. Each pocket, *c*, communicates respectively, by means of a channel, *e*, with one of the hollow legs.

The legs are composed of two parts,—G, which is fixed, and G , which is movable, the movable parts being pivoted to the fixed parts at *g*. The lower ends of the movable legs are kept closed against the ends of the fixed legs, in order to prevent the entrance of dust, by means of spiral springs, H.

I are plunger rods, which open the legs at the proper moment, and push the grain down into the ground. These rods are attached above to the slide, F. When the slide rises, rods I also rise into the interior of the legs, and the corn falls down under the bottom ends of the rods, ready to be pushed down and out When the legs are thrust into the ground, the slide, F, is pushed down, and with it rods I, and the corn is thus forced into the ground. The seeds are thus driven into the soil, and embedded with some little force. The ground in which they are embedded is also slightly compacted by the action of the legs; the grains are also planted edgewise in the soil. Thus all the conditions for rapid germination, such as securing moisture around the seed, imbedding, separation of the seeds, etc., are fully obtained. Only one kernel of corn is planted from each leg at a time, leaving four kernels to each hill, properly separated, and scientifically planted. J is an adjustable buffer head, by which the depth to which the legs enter the ground may be regulated at pleasure.

This invention strikes us as one of peculiar merit. It is light, simple, effective, and convenient. It deposits each kernel in the most approved manner, fulfilling every requisite that could be desired in an instrument of its class. We predict for it a very general introduction. Patented June 3rd, 1856. Further information may be obtained by addressing the inventor, as above, or Messrs. C. & H Umble, Gap, Lancaster Co., Pa.

Heating Cold Water by Friction.

In the number for this month of the *Journal of the Franklin Institute*, the editor says:—"Our readers may have had their attention attracted by the wonderful accounts in our would-be scientific papers, of a machine exhibited at the French Exhibition by which water was to be heated and steam of any power raised by the heat generated by friction. It threatened to be a second Caloric Engine, but the committee to which the French Academy of Sciences referred it, have shown that for raising steam it is by far the most costly means yet proposed, and that cooking by it is impossible. By it, 8 men, working for 4 1-2 hours, were unable to raise 1 1-3 gallons of water from 42° to 169° Fah."

Last year, when so many paragraphs were floating around respecting the wonderful feats of this engine, we pointed out their absurdities, and stated that it would prove a total failure; that it was unphilosophical in principle, and besides, it was not new. The above paragraph confirms all that we stated respecting it.

Page's Saw Mill Patent Suit.

We would invite the attention of our readers to the advertisement of Geo. Page, on another column, where they will find a correct statement of the patent trial which took place at Canandaigua. We published the account of that trial as taken from an Elmira paper, and gave it credit for the same. It seems the statement was wrong, and this we find to be generally the case with accounts of patent trials scientific experiments, &c., which appear in our daily papers. We attribute this to the general want of correct information respecting such subjects on the part of the reporters and editors.

A Patent Extension.

On the 13th inst., a Bill extending the patent of the "Adam's Printing Press," passed the House of Representatives by a majority of 40 votes. It has also passed the Senate by a handsome majority.

A Picture of Hampden.

The Senate, on the 13th inst., by a vote, accepted an original portrait of the patriot John Hampden, presented by John McGregor, Member of Parliament for the City of Glasgow, and Secretary to the Board of Trade, in England. It is to be placed in the White House.

Revolving Boiler.

A steam boiler te revolve on an axis, like a coffee-roaster, has lately been invented in England.—[Exchange.

Nothing new in this boiler, and nothing practicable. An engraving of such a boiler will be found on page 217, Vol. 2, Scientific American—published eight years ago.

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Scientific American.

NEW-YORK, AUGUST 23, 1856.

One Thousand Dollars Reward.

The terms of subscription to our paper are $2 a-year for single copies, but the prices are less where a number of persons combine together and form what is called a Club. Packages of twenty or more subscriptions are supplied at a discount of *thirty per cent.* below the single rates, or $1·40 each, per annum. The allowance of this liberal discount forms a strong inducement, for the simultaneous subscription of several persons in any given neighborhood, and many thousands of names collected in this manner, are annually endorsed upon our books. But in every locality it is necessary, for complete success, that some one or two enterprising individuals should head the movement, or, in other words, "boss the job." They must see to the collection of the money and its remittance to the publishers. They generally re-imburse themselves for the trouble and time spent in making the collections by a percentage in the shape of an increase on the publisher's charge.

It has been our custom, for several years past, to encourage and stimulate the activity of those who undertook the formation of clubs, by offering handsome cash Prizes for the largest lists of subscribers. Last year we paid out $450 for this purpose, but this year we propose to pay more than double that amount. It will be seen by reference to our new Prospectus in another column, that we offer *One Thousand Dollars* for the twelve largest lists of subscribers that are sent in to us between the present time and the first of January, 1857. The following is the manner in which the awards will be made:—

For the largest List,	$200
For the second largest,	$175
For the third largest,	$150
For the fourth largest,	$125
For the fifth largest,	$100
For the sixth largest,	$75
For the seventh largest,	$50
For the eighth largest,	$40
For the ninth largest,	$30
For the tenth largest,	$25
For the eleventh largest.	$20
For the twelfth largest,	$10
	$1000

Here is a grand opportunity for persons of enterprise, young or old, to improve their fortunes. It is the simplest matter in the world to obtain subscriptions to such a paper as ours. Unlike political or partizan sheets, the mere presentation of which is oftentimes repugnant, the SCIENTIFIC AMERICAN *is welcome everywhere.* Its pages are always laden with riches of an intellectual and practical character. No one can examine a single number without feeling that it is suited to his wants, and that he *ought to be* a subscriber. What *ought* to be *will be*, if the canvasser does his duty.

In view of these facts, we confidently hope that the number of SCIENTIFIC AMERICAN Clubs formed this year will be greater than ever before known. The field is a broad one and open to all. Last year the highest prize, $100, was carried off by Canadians, greatly to their credit. This year the first prize is doubled in amount. Let there be a strong and healthy competition in every quarter. Those who work the hardest will get the highest rewards.

One Thousand Dollars, cash, will be paid by us on Jan. 1st, 1857, for the twelve largest lists of subscribers, that are obtained for the SCIENTIFIC AMERICAN. Those whose purpose to compete should begin at once.

On Reading.

Why should so many persons be so very careful with regard to the food with which their bodies are nourished, and pay so little attention to that for the mind? The seeds of disease can be as easily sown in the mind as in the body, and the disease is far more difficult of cure. Every paper and book that is read, exerts a useful or deleterious influence, not only during life but after it. The words and actions that are influenced by books and papers go forth to exert an influence for good or evil upon others, while the food taken into the body is limited in its influence, and that but for a short duration. It is, therefore, of immense importance that every person should be exceedingly careful in the selection of his reading, for in the mass of general reading how little there is of truth, how much of error and untruth. In view of the great amount of unreliable reading in vogue, the question "what is truth," may not only be often asked with propriety, but also "where is truth."

A continual indulgence of the appetite in unhealthy and unsubstantial food will soon enfeeble the body, and make it enervated and effeminate; and it is just the same with reading, which is food for the mind. What then can be expected of those persons whose mental food almost entirely consists of the most trashy literature—its chaff, straw, and stubble? Effeminacy and weakness of intellect. We regret that such a charge can be preferred against the vast majority of our own people, and those of every other enlightened and civilized nation. The records of literature prove that for one reader of real solid and useful papers and books, there are a hundred who feast on the wildest and most frothy works of fiction. Such reading must be injurious to the mind, because it furnishes it with no genuine aliment.

The most useful works in the libraries of the Mechanics' Institutes in England have a very limited number of readers, while those of a light and amusing character have a host. We hope it is not so with the members of our Mechanics' Institutes; and in some instances brought to our knowledge, we are happy to say, it is not. Still, it is the very few among the great mass of our mechanics, artisans, and farmers, especially our young men, who read useful works; the great majority are intense readers of love-sick stories and bombastic fictions.

A man may cram his mind with reading and yet he may be very ignorant and ill-informed. What is knowledge but truth? The man, therefore, who desires to be well-informed (and who does not?) should make truth the object and aim of his reading. Every young man, especially, should endeavor to cultivate habits of judicious reading. He must pursue truth with assiduity if he would store his mind with knowledge; he must endeavor to derive solid pleasure from the study of true and useful works if he would rise to eminence in literature, in politics, in law, in engineering, in chemistry, in any of the sciences or pursuits of life, to be distinguished in which, implies a cultivated mind.

The character of a man is as much indicated by the books and papers which he reads as by the company with which he associates. We have but to know what books and papers a young mechanic, engineer, or artisan reads to form a very sound opinion of his qualifications and his abilities. If he takes no paper or periodical containing useful information relating to science, art, and improvements, he cannot be intelligent; he cannot be expected to attain to distinction in his profession, for he denies his mind that food which is necessary for its proper growth and sustenance.

The Qualifications of Engineers.

The recent steamboat and railroad disasters which have occurred in different parts of our country have called forth a number of criticisms respecting the qualifications of our engineers entrusted with the charge of running steamboats and locomotives, and some of these not very flattering to their reputation. It is to be regretted that too many persons are appointed to the charge of steam engines who are very defective, by want of education and thorough experience, and by defects of character—such as the want of good judgment, care, and decision—to such important trusts. An engineer in charge of a locomotive or steamboat engine is placed in an awfully responsible situation.

For collisions on railroads and steamboats, engineers cannot be justly blamed; conductors, pilots, and captains are the responsible persons for such disasters. But so far as it relates to burnings and explosions in connection with the heat of flues, over-pressure of steam, want of water in boilers, and defects of apparatus and machinery, the engineer is responsible.

What are the qualifications necessary to fit a man for such an important situation? Some have asserted that an engineer should not only be capable of managing, but constructing steam engines, and all their necessary appendages. This is simply preposterous. It is not necessary to be able to construct a ship and all its parts, in order to command and navigate it. Engineers, in general, are machinists, capable of working at the lathe, filing, and fitting up. They are not forgers, molders, or boiler makers, nor is it required that they should be.

An engineer should understand the whole physiology of the steam engine, and be able to take down and fit all its parts together.—He should be a draughtsman; understand the quality of metals; the relative proportions of all parts of an engine, how to work it to the best advantage; and have a most thorough understanding of the nature and action of steam and the construction of steam boilers; and with all the practical and scientific knowledge necessary for his business, he should be intelligent, careful, and decisive. We know one of the most experienced and able locomotive engineers in our country who could not be trusted with running an engine. With all his well-known practical skill and knowledge of the engine, when he used to run a locomotive some years ago on one of the railroads in this State, he was for ever running off the track, or committing some such error. He was sure to be too long in slacking speed before approaching a narrow curve, or a station; and while he could plan, draught, and build locomotives, he was defective in qualities for running one. It is just as necessary to have peculiar qualifications for running as for constructing a steam engine.

It is a fact too generally overlooked, that the most important—because the most dangerous part of a steam engine—is the boiler and its appendages; and engineers, in general do not sufficiently qualify themselves in this department of their business. We would exhort engineers to give more attention to the study of the steam boiler.

Too many explosions are caused by inefficient steam boilers—not supplying a sufficient quantity of steam; hence to raise the proper quantity for a certain speed, it requires tremendous firing and forcing to get the work out of the boilers. It is just like the overtasking of a noble animal in running a race—it must perform so many miles per hour, or be foundered in the attempt. This appears to have been the cause of the late explosion on the steamboat *Empire State.* For such defects of steam machinery the owners must be held responsible. The Coroner's Jury at Fall River, in that case, have exhonorated all parties from blame for this accident. What are the Inspectors for this district going to do? They appear to be very slow in their action; they must he held responsible for it until they have done their whole duty.

Recent American Patents.

Metal Planing.—By Chester Van Horn, of Springfield, Mass.—Consists in a peculiar manner of supporting the cross head or cross slide on which the tool stock is fitted, whereby work of any width may be planed. In the ordinary machines, the width of the work is more limited.

New Drawing Instrument.—By W. J. Kammerhueber, Washington, D. C.—This is an instrument for faciliting the draughtsman in the construction of linear perspectives. It consists in providing the sides of the drawing-board with raised edges of circular form, the sweep of the circle corresponding with the distance of the vanishing point. The lines are drawn with a common T-square, the base or cross piece of which is provided with a couple of pins. The pins rest against one of the circular edges above named, and on being moved around against the circle, the blade of the square will always indicate the correct line of perspective. This simple device takes the place of complicated and expensive mechanism, which has heretofore been required. To artists it will prove a valuable acquisition, as its use will save much time and labor.

Improved Fire Arms.—By Gilbert Smith, of Buttermilk Falls, N. Y.—This invention is applicable to fire arms having the sliding breech and those having the hinged breech, or to almost any that have the breech movable separately from the chamber, and are loaded at the rear of the chamber. It consists in forming a groove around the chamber near the extreme rear thereof, to produce a lip from the solid metal of the rear of the chamber, of sufficient thinness and flexibility to be driven back against the breech by the force of the explosion of the charge, and thereby to prevent any escape of gas, and consequent loss of the force of the explosion. The above is an excellent improvement.

Gold Washer and Amalgamator.—By W. S. Pierce, North Attleborough, Mass.—In this improvement the inventor takes advantage of the well known fact that mercury when heated to a temperature of 212°, will absorb five times more gold than at 60°. The apparatus consists of a large box, in which a furnace for producing the heat is placed. The top of the box is beveled, and covered with an inclined plane or bed, over which the crushed quartz or gold bearing dust, mixed with water, is caused to flow. Ledges or pockets containing mercury are placed across the bed so as to intercept the gold. The fire below heats the mercury, and the precious metal is thus absorbed. At the lower end of the inclined bed is a fine screen, through which the finer particles of gold that may have escaped the mercury, fall. They are received on a sponge, which duly retains them.

Machine for Manufacturing Sheet Metal Ware.—By T. Gomme and C. E. A. Beaugand, of Paris, France.—This invention relates to the manufacture of brass kettles, and utensils of various kinds from sheet metal, without brazing. It consists of a peculiar construction of the stamping punch, one portion of which is made to hold the stamped metal in place during the operation, while the other portion of the punch withdraws for a new stroke.

Improved Odometer.—By Smith Beers, of Naugatuck, Conn.—This is an instrument for indicating the distance traveled by carriages. It consists of a combination of small cog wheels and indexes placed in a box and fastened to some convenient part of the vehicle. There is an elastic connection between the instrument and one of the wheels of the carriage, so arranged that at each revolution of said wheel one of the cog wheels of the apparatus will be moved, and a change of position be thus imparted to all of the others. The instrument exhibits to the eye and keeps an accurate account of the miles and fractions traversed by the vehicle.

Improvement in Paints, Inks, Dyes, etc.—By Frederick Kuhlmann, of Lille, France. The patentee's name is familiar, no doubt, to our readers, and to the scientific world in general. He is one of the most distinguished chemists and savans of Europe. The invention for which he has just secured Letters Patent in this country appears to be one of much practical value; and of universal application in the arts. It consists in the admixture of alkaline silicates with paints, varnishes, inks, dyes, etc. Silicates have heretofore been applied as coatings, or varnishes, or layers, and the colors laid thereupon.

We copy from the patentees specification the following statement of some of the methods of application and advantages of his improvement:

"My invention consists in the application of alkaline silicates, or of several silicates with different bases, to cementing, painting, printing, and dressing or finishing fabrics. The silicate which I prefer using, as being the most economical to prepare when it is applied as a solution, is silicate of potash, which is or may be obtained by heating silica during six or eight hours in a solution of caustic potash having a specific gravity of about 1·160, the temperature being that corresponding with a pressure of five or six atmospheres. Instead of potash I also sometimes use caustic soda, but this latter is more liable to produce white efflorescenses on the painting, especially if the

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silicious compound be not thoroughly saturated with silica. The vessel which I use for the said preparing operation is a strong cylindrical steam boiler; the silica is kept from the bottom of the boiler by means of a diaphragm of perforated sheet iron, and by using silex or pieces of common gun flint, such as they are found in chalk formations, the calcareous matter adhering to the same having previously been got rod of by washing with dilute muriatic acid, it will be found that the solution is effected without any sediment settling at the bottom of the boiler. When sand is used it will be advisable to employ some mechanical means of stirring or agitating, but I generally prefer using gun flint, either in its native state, or else after having disintegrated the same by chilling it in cold water when red hot. However, all silicious matters may be used and yield solutions that are more or less colorless. The solutions thus obtained are sufficiently thick or dense to be used at once, and it is even necessary to weaken them for very siccative or fast-drying paints or colors; on the contrary, when it is desired to produce a varnish, the solution is still further concentrated. The silicate may also be prepared in the dry process. The operation in this case is carried on in a reverberatory furnace by using one and one-third, or two parts of silica to one part of carbonate of potash, and I heat the whole during six or seven hours till a complete fusion is obtained. This modus operandi may be objected to when used for making solutions for painting, on account of certain sulphurets remaining present, which causes several colors to grow black or dark, but this may be obviated by melting the compound in a crucible, and adding a small portion of nitrate of potash to the mixture of silica and potash.

The solutions of alkaline silicate which form the base of my new or improved paints, are reduced to the proper liquid consistency for being used with the brush, by mixing said solutions with the greater part of mineral colors or pigments, either natural or artificial, that are at present in use; excepting of course those that are altered by the presence of the alkali, as Prussian blue, for instance. Some colors of the same kind are difficult to apply, and require precautions, being rather strongly attacked by the solution of silicate of potash, and by partially combining with silica for instance white lead, chromate of lead, etc. These latter kind of colors must therefore be used with weaker solutions or else in conjunction with substances having a less affinity for silica. It may also be observed that even the more insoluble kind of colors are attacked a little by the silicate; among these we have the artificial or natural sulphate of barytes, which form an exceedingly white and cheap base, and agrees very well with the silicate by thoroughly uniting with it. Although this white base does not cover quite so well as white lead, yet it is preferable on account of the low price at which it can be obtained.

When the improved paints are used, the surface or object to which the paint is applied must sometimes be filled up or cemented, the same as when oil, turpentine, gelatine, starch, etc., is used.

For this purpose I form a cement or mastic from the same solution, which is concentrated for the purpose. and compounded with fast-drying substances, such as white lead, artificial carbonate of barytes, phosphate of lime, chalk, ocher, oxyd of manganese, oxyd of iron, etc., the mixture being applied to the joints.

The silicate colors above described may be rubbed over or smoothed down with pumice stone, they can also be laid on in several layers and covered with a varnish that is made with a dilute solution of the same silicate as has been used for making the paint itself. The silicious paints may not only be applied to stone and wood, but also to metals, glass, and porcelain.

These colors sticking very satisfactorily to metallic substances, ochre and oxyd of manganese, or oxyd of iron and silicate, may be used to preserve the iron from rust, instead of minium (red lead) and linseed oil; also, by applying successive layers of a mixture of silicate and artificial sulphate of barytes, upon brightened surface of cast-iron, a very durable and hard kind of enamel is obtained, that can be vitrified by heat if required. Oxyd of manganese may be used in the same way, and gives a black enamel of a superior description. The silicate colors produce remarkably fine results when applied to glass painting; and the pigments which I chiefly make use of for that purpose, are transparent or opaque enamels, which are reduced to fine powder; all the other colors, and also ordinary gum-lac colors, are equally applicable, but these latter are liable to get changed by the presence of free alkali, and are less solid than mineral colors. I also sometimes form an imitation of dull-ground glass, by applying artificial or natural sulphate of barytes and the soluble silicates on glass, either cold, or vitrifying the same by heat, so as to produce white enamel.

The processes above-described for glass-paintings, are equally applicable to porcelain, which may be ornamented with the varied and elegant colors, either when it is enameled or not, (viscotto); the painting in the latter case, being coated over with silicated varnish or enamel.

In any of the applications above set forth, the varnish or enamel after some time becomes insoluble in water, even if it be boiling; this insolubility may be still further insured by the addition of the coloring oxyds, or of a small quantity of artificial carbonate of barytes, which is dissolved in it at a gentle heat. In some cases when the colors are not very siccative, they may be rendered more insoluble by washing the painting after it has hardened, with a dilute solution of hydro-fluo silicic acid, which fixes the potash—however, this means need but very seldom be resorted to.

The paintings may be made still more insoluble by washing them with a solution of muriate of ammonia. My new black colors, or pigments, which are made with lamp black, are as homogeneous or mix as well as the others. In these colors there is no danger of a double silicate forming; it will also be found useful to increase the drying powers of the silicate, by adding a little artificial carbonate of barytes. The same precautions may be taken with respect to other colors, that are not very liable to be attacked by the alkaline silicate. These black colors may also be used as printer's ink, giving a very fine and durable letter press. As the silicated ink, however, is liable to get thick soon under the roller, a little treacle may be mixed with it, to facilitate the work. Instead of black colors, any others may equally be applied to paper; also, by printing a colorless and concentrated solution on the paper, I prepare the same for gilding or silvering, or the silicious solution may be used for fixing on paper and other surfaces, thin leaves of metal, which are previously rendered adhesive, merely by slightly damping them with saliva or some other gummy liquid. The processes described with regard to letter-press printing, are also applicable with regard to the manufacture of papers for hanging rooms, etc. The same means and processes may also be applied to fixing on fabrics, certain adjective colors, such as ultra-marine, and for printing on fabrics any lac-colors of organic origin, which give tolerably solid designs. The colors may be fixed by using, in suitable proportions, any of the above substances employed for rendering the silicated *paintin* insoluble, or any salt that decomposes the silicate, that is still soluble, answers the same purpose. The silicious solutions can be also employed as the base of a most unalterable writing ink. For this purpose, I prepare a liquid of a brownish-black, by boiling pieces of old leather with a solution of caustic soda or potash, and this alkaline solution is then saturated with silica that is in a state of jelly, and if a deeper black is to be given to the ink, the carbonaceous ingredients of Indian ink must be added.'

Recent Foreign Inventions.

Reworking Waste Fiber of Cloth.—S. C. Lister, of York, Eng., has secured a patent for reducing hard waste fiber with a twist in it, like cord, or woven cloth of cotton, silk, &c., to be worked over again. The waste is first cut in a machine into short lengths, then it is put into a machine having revolving arms, like a rotary flail, and beat for some time. This loosens the several strands in the same manner that plasterers loosen the hair used to mix with their first coat for walls.—After this beating it is placed in a chamber and exposed to the action of steam, then taken out, dried, and submitted to the action of the common carding engine of a cotton factory. This process is stated to be a great improvement in the way of treating shoddy, or waste cotton twists, to be reworked and put into new fabrics.

New Lubricating Compound.—H. Hyde, of Nova Scotia, patentee. Take 100 gallons of clear coal oil, and 7 lbs. of india rubber; heat to a temperature of 150° Fah., and agitate them from time to time for several days, until the india rubber is dissolved. The liquid is then passed through a fine seive into a vessel, where it is suffered to remain several days, when it becomes perfectly clear, and is fit for use. For most purposes this will make a good lubricating oil; but it has been used for many years in various parts of the United States.

Hollow Iron Spikes.—C. May and P. Prince, Eng., patentees.—This invention consists in the manufacture of hollow iron spikes or tree-nails. The portion of the spike at the head is made thicker than the point; the point is stated to be made in the shape of a quill, to be driven into wood without a hole being bored for the purpose.

New Glass.—In making common transparent glass, some potash and soda are generally employed as fluxes for the silica, but L. I. F. Margueritte, of Paris, has obtained a patent for dispensing with these in making transparent glass, by the use of silica, lime and albumen alone. By calcining a mixture of silica 65·47 parts, lime 25·80, and albumen 8·73 parts, a perfectly transparent glass, is stated, can be manufactured.

If these ingredients produce a good transparent glass the discovery is a valuable one.

Hydrogen Gas for Locomotives.—H. Wickens, of London, has secured a patent for improvements in locomotives, one of which consists in placing retorts in the furnace in such a position that they can be easily fed, with iron filings, and as easily emptied. A pipe in connection with the boiler admits steam to these retorts, and as the iron filings are kept red hot, they will decompose the steam by depriving it of its oxygen, setting its hydrogen free (water is composed of hydrogen and oxygen.) Another pipe allows the hydrogen to pass into the furnace where it is ignited and mixes with the products of combustion to produce an intense heat. Although hydrogen gas produces but a feeble light, it gives out a most intense heat when ignited; still, it appears to us that, as much heat must be absorbed in the furnace by decomposing the steam to produce the hydrogen, as will be gained in the liberating of hydrogen in the furnace. This, however, is a question to be determined by experiment alone. Steam has been introduced into furnaces for the purpose of producing a greater degree of heat, by resolving it into its elementary gases, and the great objections to its use has been stated to be a rapid oxydation of the grate bars and sides of the furnaces; the plan of Mr. Wickens removes this objection or evil, but not at less cost, we presume, taking into consideration the wear and tear of the retorts, &c.

Epidemics.—Yellow Fever.—Its Cause.

The discovery of the cause of any epidemic would be of vast importance, for "a pestilence that flyeth by night and walketh at noonday" is a terrible visitation to any community. Although volumes have been written on epidemics, their causes are still veiled in much doubt and obscurity.

Some of our Philadelphia cotemporaries, especially the *United States Gazette*, have recently published some good articles on the causes of cholera and yellow fever, still, they contain too much that is indefinite.

Of late years the cholera and the yellow fever have been the most appalling epidemics with which our country has been visited. The latter is a fever which appears to have its origin in the West Indies, South America, and in some parts of our Southern States, and is chiefly confined to those regions. Local causes no doubt, give it the peculiar character for which it is distinguished. If these were known, the question arises, can they be removed.

The *U. S. Gazette* says:—"The localities of yellow fever have been described, and the features which they possess in common have been noted. There are, in a great many places, a mixture of sea and land air, maritime exposure, a hot and moist air, low ground, marshes, swamps, vegetable and animal remains in a state of decomposition, and a mixture of this product with the human or vegetable mold, forming made ground, with scattered materials on the surface directly exposed to the operation of the sun and air at a high temperature. This is a description of the localities also of those fevers, intermittent and remittent, with which we are so familiar, and which are sometimes designated by the title of marsh or paludal, after their ordinary locality, also of periodical or intermittent, and, finally, miasmatic or malarious, from their presumed origin in miasma, generated in the soil by the action of hot and moist air."

This paragraph is somewhat confused, bu it points to one cause of yellow fever distinctly, viz., exposure of upturned new soil, and this apparently has some foundation in fact.

Dr. Barton has stated that from 1796 to the present date there has been no great epidemic of yellow fever in New Orleans without an extensive breaking up of the soil, such as digging canals and basins, or excavating the streets. Dr. Levert, of Mobile, traces epidemic yellow fever in that city to similar disturbances of the soil, and in Charlestown, S. C., such works are forbidden during hot weather. In 1795, during the yellow fever in New York, it prevailed most extensively (as stated by Dr. Bayley,) and was most fatal in situations where the ground was *new made*. There can be no doubt, we think, but that new made ground exposed in hot weather tends to cause fevers. In all the new countries West, intermittent fevers and fever and ague are most prevalent during the season succeeding the first breaking up of extensive tracks of new soil in spring. A useful lesson to be derived from these facts is, that the plowing up of extensive tracts of new land should always be performed in the fall season, and that extensive excavations and exposure of much fresh soil should never be permitted in cities during very hot and moist weather.

The breaking up of new land or excavations, however, will not account for all epidemic yellow fever, for its prevails, more or less, every season, in some part of the intertropical regions of our continent. It is a disease which is asserted to be infectious by some, and denied to be so by others. It will visit a place one season, then after a certain period disappear, and perhaps not return again for a number of years, and perhaps never. It prevailed fatally and extensively in Norfolk and Portsmouth, Va., in 1855, when there were no extensive excavations carried on, while this summer these cities have been comparatively healthy. Some persons asserted that the yellow fever as an epidemic traveled in circuits, and that from New Orleans it was traveling around the cities of our Atlantic coast, and would visit Philadelphia and New York this summer; but these predictions have not been verified by facts, for the city of New York—although it never experienced a hotter summer—never was healthier; no epidemic in any form has yet visited it. Some cases have occurred at the Quarantine Hospital at Staten Island, brought in by ships from Havana, and some such occur in the same place almost every summer, but no epidemic has made its appearance.

Fire-Engine Playing.

The Adrian (Mich.) *Watch Tower* states that "Albert" engine, No. 1, of that place, threw a stream out of a 7-8 inch nozzle on the 1st of August, to the distance of 238 feet 2 inches horizontally. In all accounts of horizontal playing with fire-engines, the hight at which the pipe was held should be given. The nozzle should be laid on a board perfectly true, as the elevation of it a single inch makes quite a difference in the measured length to which the stream is thrown.

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TO CORRESPONDENTS.

J. K., of Ohio.—We cannot advise you about the prospects of a market here for bed pins; we do not know of any one here engaged in the sale of this article,

W. H. G., of Vt.—The stitch made by Howe's patent sewing machine is not patented. He has a patent for the mechanical contrivance for forming the stitch.

S. H. Wilder, South Carver, Mass., wishes to obtain the address of Joshua R. Gatchell, formerly a manufacturer of hydraulic rams at Chester, Pa.

W, W. G., of Mo.—Such a husk splitter as you describe could not fail to pay well in many localities.

W. R., of Ky.—We are not acquainted with what you call "Carpenter's plan of boiler setting." You should have sent more definite information respecting it.

H. N. B., of ——.—Experiments have been made wtih a telegraph cable, such as you suggest, and those experiments excite the fears of Mr. Barnes, for the success of the Atlantic Ocean cable,

J. B., of Ala.—The most expeditious method of heating water for baths is by steam, but this requires a steam boiler. The next best plan is to heat the water in a large caldron by a furnace under it, and draw off the hot water as required, to the baths. The caldron must be kept on a floor above the baths to allow the hot water to flow to them by gravity. We like the steam heating method best, but it is the most expensive to get up.

I, H. S., of Ga.—The plan of boring with a wooden rod attached to the shaft auger was used in mining, in England, before iron rods, and they are so used in some situations yet.

W. D. McC., of N. Y.—Add from ten to fifteen parts of tannin to the sugar of milk for the tooth powder; and use the lake to give it a color suited to your taste.

G. B. O., of ——.—Stimulants are those drugs or substances which produce a quickly diffused energy in the heart and arterial system. You discuss the question in reference to their action on the stomach, respecting which you are too general in your remarks.

E. P. T., of Va.—You can easily try the experiment with the piston in the keel of a vessel. The piston will not be operated so as to be of any benefit in propelling a vessel by the action of the waves. The safety valves placed in the cylinder are new to us and appear to be good.

L. P. C., of Pa.—There is no patent, so far as we are aware, for placing the buckets of the pumps in the manner described by you, but it will be very difficult to point out the patentable feature.

E. C., of Mass.—Woody fiber must first be converted into sugar before alcohol can be made from it. This can be done, but not to make a profitable business of it.

J. B., of Wis.—The silicate of potash is made by boiling pure white sand, or flints, in a strong lye of caustic potash, it is cheap where patash is plenty; it is transparent. Dissolve as much sand as the potash will take up. It soon hardens, but it must be put on in thin coats, on successive days, or it will crack off. The best covering for your gravel walls would be two coats of boiled linseed oil mixed with litharge.

A. A. S., of Ind.—Your samples of black, dyed on cotton, are very good, and your plan of dyeing is new; but it is very difficult to obtain a patent for any such chemical discovery. But is your plan not more expensive than the common method of dyeing black on cotton? Do you not use more than the usual quantities of dyestuffs? Make an experiment with some new coarse factory cloth.

A. O. M.—All invention must be patented in the name of the *inventor*, and if he is a foreigner, the fee is, accordingly, $500 for a British subject, and $300 for all other aliens. In case the patent is refused two-thirds of the fee is returned.

P. J. H., of Ind.—Get Morfitt's Applied Chemistry to Soap and Candle Making, it is the very book you want. Published by Parry & McMillan, Philadelphia.

M. B., of C. W.—A good Jonvall Turbine will give you as much power under a twelve foot head as an overshot wheel. The makers of such wheels assert this to be so, and are willing to guarantee 75 per cent. of the water power.

M. J. H., of N. Y.—We cannot answer your first question; the velocity of the plungers as well as the pressure must be known, to form an opinion of the distance to which water can be thrown by a force pump. The furthest horizontal distance a stream of water has been thrown by a fire engine you will find it related in No. 48, Sci. Am. Six inches thick of boiler plate will resist the largest naval artillery afloat—less, we believe, will not. A conical bullet is the best form for rifles. A rifle of 25 lbs. weight, we believe, may be constructed to carry a two ounce bullet 4,000 yards.

W. H. B. of N. Y.—Some of the metal always passes over in the scum. Put a little salt into your solder and it will carry over the scoria.

S. L., of Ill.—The sulphur in coal causes spontaneous combustion when it is moistened with water, As the coal in your bin contained sulphur, and as it was partially exposed to the weather, it no doubt imbibed sufficient moisture to cause the evolution of sufficient heat to set it on fire. You may depend upon it, lightning was not the cause.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Aug. 16, 1856:—

J. P. T. of Ill, $30; J. W. of Ind., $25: C. B. B., of Ct., $45; R. D. A., of Miss., $25; E. E., of Ill., $25; A. G., of Ill., $25; M. & C. P., of Md.. $55; J. C., of Ind., $5; J. F. S., of N. Y., $30; T. J. C., of N. Y., $115; S. Y. of N. Y., $30; J. A. R., of Mass., $30; T. S. of N. J., $30; H. L. of N. C., $250; C. T. S., of Mass., $20; B. & T. of Geo., $30; C. H. R. of Me., $30; D. N. of N. Y., $25; J. R., of Pa., $30; J. B. of Ill., $30; W. G. R. of Mass., $20; M. & J. B. of N. H., $30; A. M. J. of Va., $30; E. A. D., of Ind., $56; S. G., of O., $25; T. H., of N. Y., $15; H. C. of Mass., $30; T. V., of Cal., $15; T. B. of N. Y., $55; G. H. T. of Mats., $150; A. O. N. & Co., $30; F. F. of N. Y., $30: N. Y. & B. B. Co., $82; E. T. of N. J., $37: J. G., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, August 16:—

R. D. A., of Miss.; E. E., of Ill.; J. W., of Ind.; A. G. of Ill.; C. B. B., of Conn.; W. M., of Ky.; E. T., of N. J.; D. N., of N. Y.; S. A., of Tenn.; P. C., of N. Y.; C. H. R., of Me.; L. B. F., of N. Y.; S. G., of O.; D. N. D. of Mass.; J. G., of N. Y.; H. B. H., of O.; T. M., of N. Y.; M. & C. P., of Md.; T. S., of N. J.; T. V., of Cal.

Important Items.

New Edition of the Patent Laws.—We have delayed for some months the issue of another edition of the present Patent Laws in the expectation that Congress would most certainly at this Session, make some simple amendments to them—such as are earnestly sought for by inventors and patentees. As there is now little hope that any such changes will be made during the session, we have issued a complete edition of the laws, including the regulations of the Patent Office—copies of which can be had for 12 1-2 cents each. If any of our readers, who have ordered the laws and regulations, and have not received them, they will be promptly supplied upon renewing their requests by letter.

Models—We shall esteem it a great favor if inventors will always attach their names to such models as they send us. It will save us much trouble, and prevent the liability of their being mislaid.

To the Unfortunate—We are no longer able to supply the following back numbers of the present volume: Nos. 6, 12, 14, 15, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30, 34, 35, and 37. Such numbers as we have to furnish, are gratuitously supplied to such subscribers as failed to receive them; and we would take occasion to state, that any person failing to receive their paper regularly, will confer a favor by notifying us of the fact. Missing numbers should be ordered early, to insure their receipt, as an entire edition is often exhausted within ten days after the date of publication.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and date of patent when known, and enclosing $1 as fees for copying.

Receipts—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

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IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had Ten years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the Scientific American. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

M NN & CO.

American and Foreign Patent Attornies, Principal Office 128 Fulton street, New York.

FETTER'S PATENT BOOT CRIMPING Machine is in successful operation in many places, and can be obtained by addressing FETTER & CO., No. 5 Hart's Buildings, Sixth st. above Chestnut, Philadelphia, Pa. Agents wanted. 1*

THE PATENT DECISION—To the Editors of the Scientific American:—The statement in your paper of this morning in regard to the verdict of the jury in the case of George Page *vs.* Georgia, is a perverted one. It is true that the verdict was in favor of the defendant, but not upon the ground stated in the Elmira Advertiser, which you copied. On the first ballot of the jury there were 7 for the plaintiff and 5 for the defendant.—The jury then proceeded to take up each question separately: First, they passed upon the question of priority of invention, and decided in favor of plaintiff, George Page. The next question was, Did the defendant infringe the patent? Upon this question the jury stood 8 for plaintiff and 4 for defendant, and so stood until 5 o'clock in the morning, and ultimately brought in a verdict for defendant, upon the testimony of one of the witnesses for defendant, who swore that he had tended the mill from the time it started, and that it never had end-play. And as this formed the essence of the infringment, and it was not proven by the witnesses of complainant that the mill had been worked with end-play, though the fact is notorious that it had been so worked, the jury found for the defendant, though they unanimously decided that the priority of invention belonged to George Page, thereby sustaining the validity of his patent.

GEORGE PAGE & CO.,
Baltimore, August 2d. 50 4

MECHANIC'S GUIDE (Useful Tables and Recipes) Ten cents. History of Steam Plowing, Fifty cents. Wilson on the Horse, 12 1-2 cents. Sent by mail on receipt of price. JOHN PHIN,
1* Rochester, N. Y.

WOOD BENDING APPARATUS.—Patented March 11th, 1856, for bending plow handles, carriage, chair, boat, ship timbers, &c. This apparatus is simple and inexpensive; can be constructed by the most ordinary mechanic, and operated by hand or power equally well. Apparatus constructed to order and rights to use the same for sale. Address, JOHN C. MORRIS, No. 113 Mill st., Cincinnati, O., or R. GRIFFITH, Troy, N. Y. 50 2*

BALLOON—I will sell the Balloon "Young America," used at Boston 4th of July last, all in complete order, designs painted on, &c. Holds 10,000 cubic feet. Terms low. JOHN WISE,
50 1* Lancaster, Pa.

ALEXANDER'S COMPOUND Parallel Sawing Machine, for making lath from the slab or board cross-cutting, ripping, and sawing miter, all combined in a cheap, simple and compact manner, is illustrated in No. 50, Scientific American. Sash factories, cabinet shops, carpenter shops, etc., should have these machines. Price $60. Country and State rights for sale. Address THOS. J. ALEXANDER, Westerville, Franklin Co., Ohio. 50 5*

TWENTY-EIGHTH ANNUAL FAIR OF THE American Institute of the city of New York at the Crystal Palace.—This magnificent and spacious building will be opened for the reception of Goods from Monday the 15th, until Saturday the 20th of September. Heavy goods and articles from a distance will be received and stored in the Palace on and after the 1st of September.—Premiums—consisting of Gold, Silver, and Bronze Medals, Diplomas, &c.—will be awarded on the recommendation of competent and impartial judges. The Cattle Show will be held on Hamilton Square, a beautiful plot of ground of ten acres, granted by the Corporation of the City of New York for that purpose, on Tuesday, Wednesday and Thursday, the 14th, 15th, and 16th days of October. The Managers would impress upon exhibitors the necessity of giving immediate notice of the space they wish to occupy, and those exhibiting machinery requiring power, the amount. From the numerous applications already made, the Managers find it necessary to make further provision for steam power. Communications addressed to Wm. B. Leonard, Corresponding Secretary, will meet with particular attention. Circulars containing full particulars can be had on application at the office of the American Institute, 351 Broadway, New York.

GEO. F. NESBITT, Chairman.
John W. Chambers, Secretary. 49 3

CIRCULAR SAW MILLS—The subscriber has on hand, and is constantly manufacturing those celebrated mills, with saws from 30 to 80 inches diameter, adapted to manufacturing most kinds of lumber, and warranted to give satisfaction. For prices, &c., address W. HERRICK, Northampton, Mass. 49 8*

MACHINE BELTING, Steam Packing, Engine Hose.—The superiority of these articles manufactured of vulcanized rubber is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise, at our warehouse. New York Belting and Packing Co., JOHN H. CHEEVER, Treasurer, No. 6 Dey street, N. Y. 48 10*

PAGE'S PATENT CIRCULAR SAW MILLS with Steam Engine and Boiler, on hand and for sale for $1500, at Schenck Machine Depot, 163 Greenwich st. New York. A. L. ACKERMAN. 49 10

PREMIUMS FOR FIRE ENGINES—The large Gold Medal will be awarded for the best Steam Fire Engine, and for the best Fire Engine, to be operated by hand power, to be exhibited at the Fair of the American Institute this Fall. By order of the Managers.
49 2 WM. B. LEONARD, Agent.

SECOND HAND STEAM ENGINES FOR sale.—One of six and one of eight-horse power. In good order, and will be sold low. W. H. ADAMS,
48 2* 29th st. cor. 11th ave.

NOTICE—To Agricultural Societies and Manufacturers—G. & J. W. Gibbs, of Canton, Ohio, have invented a Dynamometer, the best yet brought before the American people for testing the draft of plows, mowers and reapers, &c. Those wishing to secure one of these valuable instruments for the coming trials this fall, should order early. Instruments warranted. Patent applied for. 48 3*

INGERSOLL'S IMPROVED PORTABLE Press for Hay, Cotton, Tobacco, &c.—A silver medal for which was awarded last fall at the Fair of the American Institute, and also at the Fairfield County Fair in Conn. On account of the cheapness, compactness, portability and great power it is exactly adapted to the wants and means of every farmer and planter, and is believed to be far superior in every respect to any other machines of the kind now manufactured. See Sci. Am. Vol. XI, No. 30. Circulars, cuts, &c., descriptive of the machine can be had on application to the Farmers and Mechanics Manufacturing Co., Green Point, (Brooklyn) L. I. 48 4*

WELTON, STEARNS & HOLMES—Artesian Engineers, Charleston, S. C., and Augusta, Ga. A. C. WELTON, I. H. STEARNS, C. B. HOLMES.
48 3*

FOR SALE—9 Volumes of the Scientific American, 2 to 10 inclusive, complete and well bound. Address J. V. HAYNES, West Meriden, Conn. 48 2*

VANFLEET'S PLANING MACHINE—Important to Builders, Dealers in Lumber, Car Manufacturers, &c.—This machine does not take half the power that the Woodworth Planer does, and is applicable and practicable for horse power. For rights and machines address. D. C. HENDERSON, Sandusky, O. 48 4*

50 STEAM ENGINES—From 3 to 40-horse power also portable engines and boilers; they are first class engines, and will be sold cheap for cash. WM BURDON, 102 Front st., Brooklyn. 41 tf

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MACHINERY—S. C. HILLS, No. 12 Platt street, N. Y., dealer in Steam Engines, Boilers, Planers, Lathes Chucks, Drills, Pumps; Mortising, Tenoning, and Sash Machines, Woodworth's and Daniel's Planers; Dick's Punches, Presses, and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting, Oil, &c 26 e3w

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description, Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Guage, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, Machinery Oil of the most approved kind, etc.

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44 4eow*

CLOCKS for Churches, Court Houses, &c. Regulators and time pieces for jewelers, railroads, offices, &c. Also glass dials of any size for illuminating, and other kinds manufactured and warranted by the subscriber.—JOHN SHERRY, Oakland Works, Sag Harbor, N. Y.
37 12 eow

CLARK'S PATENT WATER REGULATOR—The only perfect security against steam boiler explosions, caused by want of water. Every steam boiler should have one. Regulators sold and applied and rights for most of the States and Territories, for sale by S. C. HILLS, 12 Platt st., N. Y. 48 6eow

CIRCULAR SAWS—We respectfully call the attention of manufacturers of lumber to the great improvements recently introduced in the manufacture of our Circular Saws. Being sole proprietors of Southwell's patent for grinding saws, we are enabled to grind circular saws from six inches to six feet with the greatest accuracy and precision. The impossibility of grinding a saw without leaving it uneven in thickness has always been acknowledged by practical saw makers. This causes the saw to expand as soon as it becomes slightly heated in working. When this takes place the saw loses its stiffness, and will not cut in a direct line. We will warrant our saws to be free from these defects; they are made perfectly even in thickness, or gradually increase in thickness from the edge to the center, as may be desired. As there are no thick or thin places. the friction on the surface of the saw is uniform, consequently it will remain stiff and true, and will require less set and less power. Will saw smooth, save lumber, and will not be liable to become untrue. This is the oldest establishment now in existence for the manufacture of circular saws in the United States, having been established in the year 1830. Orders received at our Warehouse, No. 48 Congress st., Boston.
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KNITTING MACHINES—Circular and straight knitting machines of all sizes and gauges on hand and made to order. WALTER AIKEN, Franklin, N. H.
46 8*

PAGE'S PATENT PERPETUAL LIME KILN, will burn 100 barrels of lime with three cords of wood every 24 hours; likewise my coal kiln will burn 150 bushel with 1 tuh bituminous coal in the same time; coal is not mixed with limestone. Rights for sale.
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NORRIS WORKS, Norristown, Pa.—Inglis, Carson & West, Iron and Brass Founders, Machinists, Boiler Makers and Steam Engine Builders—Manufacture Cornish Pumping Engines of an improved construction for mines and Water works of any capacity. All kinds of Mining Machinery, Sugar Mills, Propeller Engines for Canal Boats, Blowing Cylinders, and all heavy machinery required in the Engineering business generally.

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43tf JOHN WEST.

LAWRENCE SCIENTIFIC SCHOOL—Harvard University, Cambridge, Mass. The next term will open on Thursday, Aug. 28th. For catalogue containing full particulars address E. W. HORSFORD, Dean of the Faculty. 42 8

BARREL MACHINERY—CROZIER'S PATENT is unrivalled in point of quality and quantity of work performed, and may be seen in constant operation at the Barrel Manufactory of the undersigned. For rights and machines address WELCH & CROZIER,
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TO CAR BUILDERS—For Sale, one new Upright Boring Mill for boring car wheels. Maker's price $600, will be sold for $300 cash. Address GEO. S. LINCOLN & CO., Hartford, Ct. 43tf

FOR SALE—One second-hand 7 ft. power Planing Machine, made by the New Haven Manufacturing Co. Cost $500, will be sold for $300 cash. Has been used only about four months. Also an upright drill by the same makers. Cost $90, will be sold or $40 cash. Address GEORGE S. LINCOLN & CO.,
47 tf Hartford, Conn.

BOILER FLUES—All sizes and any length promptly furnished by JAMES O. MORSE & CO., No. 79 John st., N. Y. 37 3mos

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THE NEW YORK DAILY SUN for $2 a year. The miracle of the present age is accomplished by the Publisher of the New York Sun, in furnishing subscribers in clubs of thirty or more with the daily paper by mail for $2 a year. The Sun commenced in 1833; is the oldest, as well as the cheapest of all the cheap daily newspapers. It contains the latest news to be had by telegraph, mail, or express—is independent on all subjects, and has for its platform "Common Sense." Club rates—payable in advance, 5 copies one year $16·50; 10 copies $30; 15 copies $41·25; 20 copies $50; 25 copies $56·25; 30 copies $60. Single copies $4 a year. Papers to be sent in one wrapper, and only by mail, and to be directed to one person only. The postage on the Daily Sun within the State of New York is only 78 cents per year, and only $1·56 to any other part of the United States. Specimen copies sent gratis on application. Letters (always post paid) to be directed to MOSES S. BEACH, Sun Office, New York City. 37 tf

VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Bogardus' Horsepowers, Smut Machines, Saw and Grist Mill irons and Gearing, Saw Gummers, Ratchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch.

LOGAN & LIDGERWOOD,
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FILMER & CO., Electrotypers, and Manufacturers of Electrotype Materials, 128 Fulton st., N. Y. Molding Presses, Batteries, Cases, Backing Pans, Shaving Machines, Metal Kettles, Planes, Blocks, Building Irons, etc., etc., on hand, or furnished at short notice, and at moderate charges. Adams' Improved batteries and black-lead machines also for sale. 23 tf

OIL! OIL! OIL!—For railroads, steamers, and for machinery and burning—Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer.
F. S. PEASE, 61 Main st., Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe. 33 tf

NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
Office for sale of rights at 27 State street, Boston, and Lowell, Mass, 45tf

NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co New Haven, Conn. 19 tf

HARRISON'S 30 INCH GRAIN MILLS—Latest Patent.—A supply constantly on hand. Price $200. Address New Haven Manufacturing Co., New Haven, Conn. 31tf

BOILER INCRUSTATIONS PREVENTED—A simple and cheap condenser manufactured by Wm. Burdon, 102 Front st., Brooklyn, will take every particles of lime or salt out of the water, rendering it as pure as Croton, before entering the boiler. Persons in want of such machines will please state what the bore and stroke of the engines are, and what kind of water is to be used. 41 tf

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Science and Art.

Cocoanut Oil.

This oil is extracted from the kernels of the cocoa palm, by grinding, and pressure aided by heat. The palm tree which bears the cocoa is indigenous to the two Indian peninsulas, viz. the coasts, chiefly, of Malabar and Bengal, as well as to Ceylon, the Maldives, and Siam; it is also abundantly found in the Brazils. The whole Brazilian coast from the river San Francisco to the bar of Mamamguape, a distance of 280 miles, is almost entirely covered with it.

The cocoa palm grows to the hight of 60 or 90 feet, the stem is soft and fibrous and marked with rings, occasioned by the fall of the leaves, two of which are said to drop off every year. From 11 to 12 leaves, each 12 or 14 feet long, form a tuft at the top. The flowers proceed from within a large pointed spathe, which opens on the under side. In wet seasons the tree blossoms every five or six weeks, so that there are often fresh flowers and ripe nuts on the tree at the same time. There are 5 to 15 nuts in a bunch, and in good soils a tree may produce from 8 to 12 bunches every year.

The kernels yield about 60 per cent. of oil, and they are now imported in large quantities to Europe for the purpose of making soap and candles.

Early Rising.

Early to bed and early to rise,
Makes a man healthy, wealthy, and wise.

This is an old saying, and properly understood and practiced proves itself a verity.

A certain amount of sleep and rest are necessary as "tired nature's sweet restorer;" but for these the night was made—the day for wide-awake, active, energetic, systematic, constant labor. All, therefore, men, women, and children, should be up in time to behold "the rosy dawn of day." If any of our readers indulge in different habits—turn after morning light upon their beds like doors upon the hinges, hug their pillows, and fold their hands to a little more sleep, we insist upon a speedy reformation. If they need assistance let them get an alarm clock; and if that should fail to produce the desired effect, then we would recommend to them the new invention of a friend, who will soon be out with a patent bedstead, which is to be so constructed, with a spring that it will be wound up at the right bed time, and at daylight, precisely, will run down, capsize, and turn its occupant so roughly on the floor as to make him find himself getting up in time wide-awake for all day. Will the Scientific American put this in its list of applications for new patents.

[We extract the above from *The Arator*—a valuable agricultural journal published at Raleigh, N. C. A New Yorker has got the start of the North Carolinian in the capsizing bedstead. In No. 4 of the present volume Scientific American, we published an engraving of Houses' Patent Alarm Bed, in which the inventor is represented as undergoing the capsizing process.

At the last Fair of the American Institute this invention was exhibited to an astonished multitude. It was generally disapproved of by *lazy sleepers.*

Sea Waves and Sea Sickness.

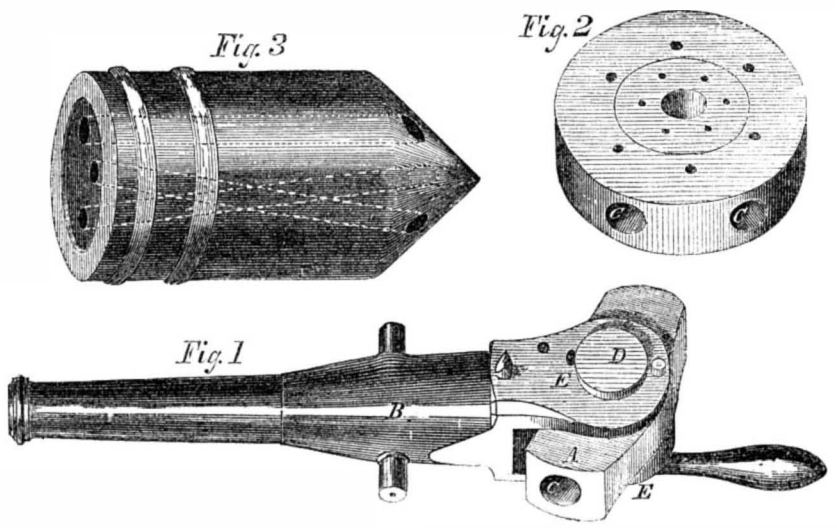
The old vague account of waves being "mountains high" was well known to be an exaggeration; but we do not think even philosophers were prepared for the statement made at a meeting some years since of the British Scientific Association by Dr. Scoresby that they averaged no more than 20 feet in altitude, and rarely exceeded 28 feet. The popular impression, principally produced by marine painters, that waves formed valleys thousands of yards across, down the sides of which ships slid as though they were about to be engulfed, seems to have been equally erroneous, as the maximum length of ocean waves, according to the same authority, is 600 feet, whilst in a moderate gale they are only 300, and, in a fresh sea, about 120 feet in length. A moment's consideration of these facts leads to the conclusion that long ships must have a great advantage over short ones with respect to the rapidity with which they make their journey, as it is quite evident that whilst the latter have to perform their voyages by making a series of short curves—much to the impediment of their progress, and to the discomfort of their inmates—the former by ruling the waves with their commanding proportions, make shorter and smoother passages. As steamers grow larger and larger, sea sickness must therefore gradually diminish.

American Steamboats in China.

A company of Americans in Canton are building two steamers to run upon the rivers of China, at first by way of experiment, and then to select that river for their future course which proves the most profitable to them.

The Chinese are a trading people, the population is teeming, and the country is full of towns, factories and fabrics of silk, pineapple rice, ivory, and porcelain, which must crown such an enterprise with signal success, if the exceeding jealousy of the people can only be overcome.

IMPROVED BREECH-LOADING CANNON AND SHOT.



Breech-Loading Cannon and Shot.

These improvements consist in constructing the cannon or piece of ordnance in two pieces, of wrought or cast-iron, or of any other material generally used for such purposes, but it is preferred to use wrought-iron, as being more suitable; one piece, A, forming the breech, or set of breeches, and another, B, the barrel.

The piece of metal forming the breech is made in the form shown in fig. 1, which has two chambers; or it may be made round, like a wheel, and contain several chambers, as shown by fig. 2. The cartridges are placed in the chambers, C. D is the pivot around which the breech, A, revolves.

The breech is secured to the barrel by means of a metal strap or band, E, and the breech is secured up to the barrel by means of a screw or other suitable arrangement, for the purpose of preventing the escape of the explosive power where the parts come together.

The improved shot or projectile is made of cast-iron and elongated, that is to say, of a length greater than its diameter, and it may be either made solid or with a hole or holes through the center, into which hole or holes is is put a thread, for the purpose of causing the projectile to revolve more or less during its flight by the action of the air upon the screw in its interior as it passes through the air. The hole or holes referred to may be either with or without a screw thread, as may be required.

To prevent the escape of the explosive power through the hole or holes during the act of firing, the patentee places behind the shot or projectile a small piece of iron or other material sufficiently strong to stand the explosive power, and slightly attached by means of wax or other means which will not be too strong to prevent its falling off when the projectile leaves the barrel—see fig. 3.

To prevent windage between the shot or projectile and the interior of the barrel, is placed a ring or rings of lead or other soft material in a groove or grooves cut or cast around the periphery of the shot or projectile, the ring or rings projecting sufficiently above the surface of the harder metal, to cause the soft metal ring or rings to fit tightly within the bore of the barrel when fired. Soft metal is used in this way, not only for the purpose of preventing any escape of air or powder whilst the projectile is passing along the barrel, but also for preserving the interior of the barrel from abrasion or injury by the action of the hard metal of which the projectile may be formed.— [London Engineer.

Water Pipe Incrustations.

In some parts of our country much trouble is experienced with the pipes which are employed to conduct water, filling up with incrustations. In Worcester, Mass., cast-iron pipes, 3 inches in diameter, laid underground for conducting spring water the distance of half a mile, have nearly filled up with scale in ten years. The water is clear and soft, and well adapted for domestic and manufacturing purposes, but the formation of scale on the interior of the pipes, and these laid underground where they cannot be conveniently reached, is a serious obstacle to their use for conducting it. Wooden, glass, and tile pipes might be used, but cast-iron pipes are stronger, and would be preferred to all others, were they not subject to encrust. A simple and cheap device or plan, to prevent the scale forming in these pipes, would be valuable information to those who use them.

The cause of incrustations forming, is a deposition on the sides of the pipe of mineral matter held in suspension by the water. This matter cannot be seen with the naked eye, but it is in the water or the crust would not form. The incrustation is simply crystalization, and the action of crystalization is what is called *polarity.* There must be a polar attraction in the interior of the pipes, separating the mineral mater in the water, atom after atom, until the pipe is nearly or wholly filled up.

The scale or crust when formed in the pipes may be removed with an acid, but this cannot be well applied to pipes underground. The grand object would be the preventing of scale forming. We do not know whether or not a counter polar current would prevent crystalization or scale forming in these pipes, but experiments can be made at but little expense. By connecting a large zinc plate with the pipes, by a wire, and sinking this plate in the moist earth, where it can be easily reached to be removed or cleaned, a voltaic current will be generated, and scale may be prevented forming in the interior of the pipe, on the well-known principle discovered by Sir Humphrey Davy, for preventing the decomposition of ships' sheathing, by attaching zinc plates to it. The experiment at least is worth a trial, because it is so simple and inexpensive.

Coal Locomotives in the West.

A report has been presented by James C. Clark, Division Superintendent on the Illinois Central Railroad, describing the economic results of using coal in locomotives in comparison with wood as fuel. He fitted up a wood burning locomotive for burning coal, and he made twenty-one trips with it, running 2310 miles. The expense for converting the engine into a coal burner was only $275, and the results have been gratifying. A wood-burning engine, running with it on alternate days, consumed 89 1-2 cords of wood in running 2310 miles, the cost of which was $389 32; the fuel for the coal-burner amounted to only 38 1-2 tuns, and cost $115 50—less than one-third that of wood. The cost of wood for all the other engines used on the railroad was in the same proportion.

The fire-box of the coal-burner did not appear to be the least injured by the twenty-one trips, and the grates were not warped in the least. The fuel was bituminous coal—that belonging to the Illinois coal fields. All our railroads will yet be driven to the use of coal for fuel; it is the cheapest they can use now, and the sooner they institute measures for its universal adoption so much the better for themselves.

An amendment to the Patent Laws, increasing the force in the Patent Office with two principal and two assistant examiners, passed the Senate on the 15th.

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